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SKETCHES OF INDIAN ECONOMICS

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SKETCHES

OF

INDIAN ECONOMICS

BY

R. PALIT

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H. H. THE MAHARAJA SRI SAYAJI RAO, G.C.S.I.
GAEKWAR OF BARODA

To

His Highness

THE MAHARAJAH SRI SAYAJI RAO, G.C.S.I.

GAEKWAR BAHADUR OF BARODA

The most Enlightened and therefore the most
Patriotic of Indian ruling chiefs,
whose interest in all that concerns India is
paralleled only by his readiness
to advance Her cause both within his dominions
and without, whose administration
is partly a reflex of all that is best in British rule
and partly an object-lesson in the art
of progressive Government, this little book dealing
with the Industrial aspect of true
constructive Nationalism, which by precept and
by example His Highness has sought to
enforce upon public attention, is with permission
humbly dedicated by

THE AUTHOR

PREFACE

It may fairly be claimed of anyone who puts forth a volume with so comprehensive a title, that he shall present in his Preface a *prima facie* case for his plea that it should be read. Perhaps the best way of doing this is to explain how and why it has come to be written. When the *Swadeshi* movement was first started in Bengal, it was thought by the writer of the present volume that the best way of helping the movement would be to run a periodical that would deal with the literature of Indian Economics and other industrial topics, and as a necessary corollary to the thought "The Indian Economist" was started. The writer had the honour to edit it for a period of about four years, after which it had to be discontinued owing to pausity of funds. Most of the essays in this volume were originally written for "The Indian Economist"; but these have been

thoroughly revised and organically enlarged in order to suit the comparatively permanent form of the publication.

How far I have succeeded in presenting a coherent, and intelligible account of the main operations of those industries that may with profit be engaged in by the rising generation of India, I cannot foretell. I should consider my labours amply rewarded if my readers find in the following essays an honest attempt to pave the way for the industrial regeneration of India. I have felt it essential to keep as close as possible to my main purpose, and not to turn aside into controversial by-paths even for the purpose of meeting anticipated criticism.

In conclusion, I desire to express my deep sense of gratitude to H. H. The Gaekwar of Baroda for kindly allowing me to dedicate this volume to him and to Rev. C. B. Clarke, M. A., (Cantab.), Late Principal of the C. M. S. Boys' High School, Calcutta, who has been so kind as to look over the proofs.

HOWRAH,
January 1910.

R. PALIT.

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COMMERCIAL EDUCATION

Industry is *productive* and *distributive*, and *technical* and *commercial* are in a comprehensive sense the two co-ordinate sides of industrial education. The necessity for such education is real and urgent—perhaps in the existing circumstances of India especially so,—and it is confidently hoped that the subject—particularly in its broad relations to the industrial life of the country, should receive the most careful consideration of every child of the soil.

In the field of industry—as in every other field of human effort—it is obvious that a systematic training of the worker is, under the conditions of modern life, an indispensable factor of success. Trained skill and scientific knowledge are factors of immense power, and all over Europe and America, this truth finds its practical recognition in the splendid educational facilities for the acquisition of

industrial and scientific skill, provided on the dual basis of popular self-help and state aid.

From the *Slojel* schools of Sweden for the manual training of boys, and the *Apprentisage* of Belgium for the instruction of artizans, to the Imperial Technical School of Moscow, and the Columbia School of Mines for the training of Miners and Mining Engineers ; from the Art Schools of Oxford and South Kensington for artists, to the Polytechnic and Technical Universities of France and Germany, and from the *E'cole Professionnelle* of Rheims for the training of clerks, to the *E'cole Superieure de Commerce* for superior training in the principles and practice of mercantile and banking business, we have a vast and varied organisation of industrial education for the benefit of every class and grade of workers. Accordingly, one of the most striking and important features of economic development in these countries is the thorough intellectual equipment of the industrial worker, and the moral nerve and self-reliant resourcefulness which it gives him. The merchant and the banker, the engineer and the architect, the mechanic and the

factory-operator, the artist and the artizan,—are all trained—thoroughly trained—each in the theory and practice of his special calling; and go where we may, we find the European or American worker leading the van of material progress —the producer holds the field of productive industry, and the merchant rules the commerce of the world. Truly, *Knowledge is power, the highest gift of Heaven vouchsafed to man here below.*

It is a hopeful sign of the times that the same truth as to the value and indispensable necessity of scientific training in respect of the national industries is dawning—however slowly and under whatever different conditions upon the public mind in India. As the first fruits of the new awakening in the sphere of *Industry*, initial steps have already been taken in most of the provinces. We have by the latest returns, besides Engineering Colleges, Veterinary Schools, Agricultural classes and Schools of Art, twenty-six purely industrial institutions with a total roll of 4,560 scholars.

In the Punjab there are five with 362 pupils, in the United Provinces four with 162 boys, and in Bengal an equal number with about 350

scholars, besides drawing classes opened in several " collegiate schools."

In the Central Provinces we have no purely Technical Schools, but *Drawing* is taught in most schools, and Carpentry classes are attached to several institutions for general education. In Madras there are 20 schools for boys and 11 schools for girls, besides industrial classes in carpentry, cabinet-making, etc., attached to High Schools. In Bombay we have, besides the Victoria Technical Institute, several others doing good work.

This is fair progress so far, and although extended, vastly extended efforts are needed to meet in any adequate way the wants of the country in regard to Technical education, we have every reason to congratulate ourselves on the success achieved in this new departure.

Our educational requirements, however, in regard to *distributive industry* remain as yet without notice and without recognition, except in the Madras Presidency, where fair progress seems to have been made, and to some extent in the Punjab ; and yet they are pressing and serious, and demand careful consideration.

Education has proved to be the mighty lever of modern progress, and the experience of the leading European nations justifies the anticipation that the educational remedy, which it is our object to urge, will be found in the long run the most effectual remedy for our present evils.

Commercial education is a pressing necessity of the present economic situation in India. We live in an age of science and science-directed activity ; and India no more than any other country in the world can hope to hold her place in the race unless she calls to the aid of her merchants and manufacturers the resources of science and scientific training. On no other basis can the industrial re-organisation of the country be achieved. Technical education goes only half-way ; and dissociated from commercial education, may even fail of much of its intended effect. Side by side with trained manufacturers, we want a trained class of commercial men, with a thorough training in the scientific principles and modern methods of commerce and a disciplined intelligence and business capacity, to get our system of distributive industry into order, and direct with

skill and success the trade-movements of the country and thereby impart a healthy tone and turn to the industrial life of the nation. In no other hands—however skilled and energetic—can the industry, trade and commerce of India flow into fruitful channels or attain to normal dimensions. Such men will soon do wonders in multiplying the resources, augmenting the trade, and adding to the wealth of the country. It is the keen eye of the trader that sees where an industry can be planted, his quick hand seizes the opportunity, his energetic perseverance develops it into a great success.

The educational system of the country as yet makes no provision, except in the Madras Presidency, for the special training of Indian youth, desirous of embracing a mercantile career; and no effort is made to direct their energies into a channel, the intelligent following of which must be of great benefit to the country, and at the same time serve to bring new dignity and vigour to the commercial life of the country. And yet it is desirable, from every point of view, to withdraw a certain proportion

of the educated classes, from the paths which lead to clerical or professional life, and to divert them into those of productive and distributive industry, such as attract so large a proportion of the educated youth of Europe. The Education Commission recommended the establishment of courses of study "intended to fit youths for commercial and other non-literary pursuits" and the Government of India in their Resolution of 1884, October 24, endorse the recommendation, adding that "every variety of study should be encouraged which may serve to direct the attention of the native youth to indurstrial and commercial pursuits."

Nowhere except in Madras, is effect given to the intentions of the Supreme Government in this regard. But time presses on, and the wants of the Indian merchant in respect of commercial education can no longer wait without serious injury to the higher interests of the country.

If, then, the necessity for providing commercial education in India be recognised, the next question is, how to provide it? Before proceeding to sketch out the lines on which such training may with advantage be organised in India it

would be of some service to give a brief account of the existing systems of commercial education in Europe.

It may be premised at the outset that in most countries of Europe, elementary education is universal and compulsory. The primary schools are excellent and every endeavour is made to attain to a high level of instruction. The course is the same for all, and embracing in its higher stages a wide range of subjects, is so framed as to meet all requirements. After the primary stage is passed, the courses of study divide off in the "Secondary Schools,"—the *Gymnasia*, teaching for the Universities and the learned profession, and the *Rea-schulen* for industrial and commercial careers.

But it is to be noticed that in these latter general education is continued, and combined with technical and special, and the specialization of the courses is carried out only at an advanced stage. Next come the "special" schools with specialized departments and curricula, training their pupils for the Polytechnic. The commercial and technical

branches proceed on parallellines, beginning at an advanced stage of secondary education and leading up to the Technological Institute. The whole system is thus a skilfully constructed organization, in which a high standard of general education is enforced as a necessary basis for all specialised instruction, and in which even "special" studies are so pursued as to yield the highest intellectual discipline, and mental culture.

In France, commercial education begins, in the Higher Elementary Technical Schools, in which Technical and Secondary education are combined. Most of these schools have a technical and a commercial department, and in the commercial section the subjects taught include *Modern Languages, History, Geography, Law, Political Economy, Book-keeping and Office Practice.* The *E'cole Martiniere* of Lyons is one of the oldest. The instruction is free, and comprises, among other subjects, *shop-work, book-keeping* and *modern languages.*

The course is one of 3 years, children are admitted between the ages, of 13 and 15. The Martiniere boys are said usually to succeed well

in their careers. From 60 to 70 per cent. go into commercial houses, making good clerks and business assistants. The *E'cole Professionnelle* of Rheims in its commercial departments trains up lads to serve as clerks in merchant houses, as commercial agents or travellers. The Paris Schools are of two grades—middle and higher. There are two middle schools. The *E'cole Commerciale* was founded by the Chamber of Commerce in 1863, and the *Institute Commercial* was established by a body of merchants as a public company, in 1884. *Modern languages, Commercial Law, Geography, Mathematics, Book-keeping and Shorthand* are the chief subjects of instruction. In the *Institute* more attention is given to foreign trade and office work. These and other similar schools are for boys from 13 to 16 years of age, after they leave the primary schools. Above these, we have in Paris two superior colleges for the instruction of better educated youths trained in the primary schools.

Besides these, there are many evening schools in Paris and other towns for men going in for a mercantile career, the course embracing among other subjects *Industrial* and *Commercial*

Technology, Civil Commercial Law and *Political Economy.*

In Germany we have first the *Realschus* which afford an education which is perhaps the best possible general preparation for commercial or trade pursuits. Above them there are special schools of commerce to be found in all the large towns. The most important point to note is that in most of the German schools, instruction in commercial subjects forms part of the ordinary school education.

These schools are well attended and are independent of Government aid. There are 17 special schools, 9 commercial, 9 middle schools with a less extended course and a large number of evening schools which are attended by clerks, merchants, apprentices and other persons engaged in mercantile houses. Persons trained in these institutions are much sought after in commercial houses.

In Austro-Hungary the commercial institutions are arranged on the German plan. In Austria there are at present 538 commercial schools and 59 mercantile printing schools. The most important of the higher institutions is the *Hande*

Akademie of Vienna, which is more a commercial University than a High School. The aim has been to make the training suitable not merely for clerks and managers, &c., but more specially for the principals and heads of business concerns, for the future bankers, merchants, manufacturers and political economists of Austria.

In Italy the bifurcation of studies begins rather too early. On leaving the elementary school, the children may either enter the gymnasium for a classical education or the Technical school, if they are intended for a commercial or industrial career. There are at present 65 technical institutions having a commercial department.

Among these may be mentioned the Technical Institute of Como, with a Commercial side, the course extending over 4 years, and comprising among other subjects *Political Economy* and *Civil Law* ; *Commercial Statistics* and *Technology*. Another institute of the same type is the Technical Institute of Udini.

In Belgium there are numerous Middle Schools preparing youths for commercial pursuits. The Commercial Academy of Antwerp is the highest

institution of commerce in the country, in which the principals of a large number of Belgian firms have obtained their business training. It is one of the best commercial schools in Europe, sending out annually a number of highly trained men proficient in *Foreign languages, Commerical science, Office-work, &c.*

In Switzerland also there is a well-organised system of commercial education. The High Schools have always a commercial section—with an extended course of commercial studies.

The teaching features of these European systems of commercial education may be thus summarised :—

(1) The *Commercial* and *Technical* branches are recognised as the cognate branches of special industrial education, and both proceed on a broad, solid basis of general education.

In all schemes of special training, much importance is attached to general culture and the mental discipline it ensures. In Germany, which in all these matters leads the way, even the special studies are pursued more with an eye to their disciplinary value than to the professional ; and much of the success of German enterprise is

due, in the opinion of competent judges, to this feature of her educational system.

(2) Commercial and technical education, combined with general, start at a common point, at the conclusion of the primary course, and proceed hand in hand up to an advanced stage of secondary education, beyond which the courses bifurcate and work up on parallel lines to the highest type of development in special schools and technical universities.

(3) The system is a graded system of education, and is so framed as to suit all classes of learners. There are the Elementary Technical Schools for lads leaving school at the primary stage and going in for a commercial career ; above them, are the special schools of commerce for advanced students.

These schools supply merchants, business assistants, commercial agents, commercial travellers, &c., and, to crown all, there are Commercial Academies imparting the highest type of training, and mainly attended by advanced students. They are intended for principals and heads of business concerns and for future bankers and political economists.

The institutes of commerce have sometimes travelling fellowships attached to them, to enable the more capable of their students to reside abroad and perfect their education.

(4) The schemes of study vary greatly, covering a very wide range of subjects. Special attention, however, is given among other subjects to (*a*) *Modern Languages* (*b*) *Commercial Correspondence* in foreign languages (*c*) *Commercial History*, *Commercial Law* and *Political Economy* (*d*) *Commercial Geography* and (*e*) *Technology of Merchandise.*

In all these European institutions the best law subjects are studied with particular care. On a right knowledge of *Commercial Geography*, the extension and development of commerce on a sound and remunerative basis are held to be largely dependent. As for *Technology*, the teaching is always illustrated by reference to raw and manufactured products in a museum which is part of the equipment of nearly every commercial school. Samples are obtained from the Chamber of Commerce and private merchants; in the newest schools the museum communicates with the lecture-room where the students handle

and test the specimens by chemical analysis or by microscopic examination.

(5) Most of these institutions have been founded by Chambers of Commerce or merchants and manufacturers, assisted by the local municipalities. The local bodies mainly bear the charge of these schools, and liberal state grants are obtained. In Germany, they are altogether independent of Government aid.

(6) Most of these schools are thoroughly equipped and great care is exercised in the selection of teachers. Good museums, libraries and laboratories are attached to almost every school and distinguished men of science and culture are appointed professors.

(7) As to cost of education, instruction in the higher elementary schools is for the most part gratuitous. In the superior institutions, high rates of fees are charged ; but for poor students there are numerous exhibitions founded by merchants and manufacturers, banking firms and Chambers of Commerce.

In Canada and United States there are what are called business colleges of every class and grade

giving a thorough training in all branches of commercial and banking business.

In England also there are a large number of Commercial Schools and Academies, and commercial subjects form part of the ordinary school curriculum.

There we have a carefully graduated course of commercial instruction, combined with a fair knowledge of general and scientific subjects, marked off into two progressive stages—(1) a junior course of 6 years for boys from 10 to 16 years of age, (2) a senior course of 2 years for boys of 17 and upwards. Examinations are held and certificates granted at the end of each course. The programme of studies is much the same as in the German and French schools.

From the foregoing review it will appear how comprehensive is the system of commercial education existing in these European countries, and with what eminent skill and success it has been built up. The recent commercial progress of Europe—particularly of the Continental nations—bears eloquent testimony to the value of such commercial training and its influence on commercial activity.

There can indeed be no stronger proof of the "Power that waits on knowledge" and science applied to the service of industry and commerce than the remarkable progress of Germany achieved in recent years against heavy odds. Even England with all her characteristic energy and disciplined strength of centuries, has had during the past few years, to revise her system of education, and bring it up on to the same line with those of the continental nations in respect of the training provided for mercantile careers.

So the preceding review of the European systems shows on what foundation we may begin and on what lines proceed.

We will now proceed to indicate the lines on which we desire that action may be taken in the country. In regard to practical action, the questions for consideration are mainly these :—

(1) What is the kind of instruction required and aimed at ? (2) What teaching agencies should be created ? (3) What are necessary funds, to give practical effect to the plan ?

On the first point it may at once be said that we ought to aim sufficiently high. No mere clerical

instruction can meet our requirements. We want not mere clerks but a superior class of trained commercial men for the service of the trade and commerce of the country. Our exporting and importing firms require men of good education to take charge of agencies abroad; even European firms would like to have such trained men in the higher branches of their establishments. The type of education required being so defined, the next question is, what teaching institutions are required? The idea of a superior Commercial Academy like the *Handel Akademi* of Vienna has, of course, for the present to be put aside, since the cost of equipment and maintenance would of itself be prohibitive. But we think it would not be utopian or in any way out of harmony with existing needs to suggest that there should be one Central College of Commerce in each province, with feeder institutions all over the country, to impart to our youths going in for commercial pursuits the superior kind of education that is necessary. The aim of the colleges should be to train up managers and directors of business concerns, and to attract to the higher

branches of commercial life some of the better educated men and thereby to drive into the channels of national commerce a proportion of the youthful cultivated intelligence of the country. As for the programme of studies, we would advocate the adoption of the scheme of commercial education approved by the Associated Chambers of Commerce in England. It is a most carefully worked-out scheme, and with a few modifications would suit our requirements best.

Besides a *European language*, English, French or German, a knowledge of *an Indian Vernacular*—say Hindi or Gujerathi, Bengali or Tamil, should be insisted upon, and other subjects, *Commercial History*, *Commercial Geography*, *Political Economy* and *Banking*, *Commercial Law*, *Correspondence* and *Chemical Technology* of merchandise should form part of the curriculum. The course of the college should be one of 4 years— *fourth year* standard of the English scheme being taken as the starting-point ; and be divided into three stages—(1) a *Junior* course (2) a *Senior* course, each of $1\frac{1}{2}$ years (3) an *Advanced* course for the fourth

year ; to which there should be three corresponding examinations (1) *Junior Certificate* (2) *Senior Certificate* (3) *Honours* Examinations in commerce. The College should be affiliated to the University, and be recognised for the Honours list, which should entitle the passed candidate to a University Diploma in Commerce. Here as also in other directions, co-operation of the University would be necessary, and we may be sure, it would not be withheld. In the eloquent words of the Rev. Dr. Mackichan (*Vide* Convocation Speech 1890, Madras University), we would say, "if the life of the nation requires it so long as Universities are in touch with the life, they will become to respond to that demand." The recognition of the College for the Final Test by the University would be much appreciated and would serve to give a strong impetus to the studies. The test of qualifications for admission to the college should be sufficiently high—certainly not lower than the matriculation test of the University. Any lower standard would afford no guarantee of an adequate basis of general education, so much insisted on and rightly, in all Continental

schools, and without which specialized instruction misses its higher disciplinarian aim.

Next as to *control* and *management*. The High School classes would of course be under the control of the Educational Department. The Provincial schools would be under direction of the authorities of the colleges to which they might be attached. As regards the Central Colleges, they should be, like the Victoria Technical Institute of Bombay, under the direction of an independent Board on which Government, the University, the Municipality and the Chamber of Commerce should be represented. The institution should be under a competent specialist as Principal with an adequate staff of tutors. The College and the Schools would require to be equipped with museums, laboratories and libraries.

But the success of any such scheme of commercial education must mainly depend upon the support and co-operation it might enlist of the mercantile classes. The demand for men trained in these institutions would have, at the initial stage, to be improved and supplemented by the recognition by Government of those tests as

"qualifying" tests for admission to some of the lower and higher branches of the Revenue Services such as *Customs*, *Excise*, *Accounts* &c.

Lastly, comes the question of *Funds*. The sources of income would be (1) fees of scholars (2) charitable and private endowments, (3) Government grants and (4) municipal contributions.

But we have also a right to count upon the cordial support, for carrying out the scheme, of the Chambers of Commerce (Provincial) which, as representing in our midst the broad views and liberal sentiments of the middle classes in England, should never withhold their encouragement and help from projects, calculated to advance the prosperity of the country. Next as to *Government Grants*,—it is allowable to hope that they would be liberal. They might advantageously take the forms of salary-grants as in Madras. The object of the scheme has the approval of the highest authorities in the land, which is none other than to divert into the channel of industry and commerce some of the youthful talent and energy of the country, which is now, more or less, for want of a field and in the absence of needful facilities, running to

waste ; and we may depend upon it, it would receive at the hands of the Local Government all the support it deserves. Lastly, as to municipal contributions, much would depend upon the attitude which the municipalities might think fit to take in the matter. Without their support it would not be possible to start the technical and commercial institutions as proposed. So the municipalities must lead the way in this movement, and should they be disposed liberally to respond to our appeal for help in the new departure the success of the scheme is assured. The main features of the scheme above detailed might be thus summarised.—

1. *A Central College of Commerce* in every province under an expert Principal, to work as an aided Institution under the control of an independent Board ; with a four years' course, arranged in 3 stages, junior, senior and advanced, the last to qualify for a Diploma in Commerce.

2. *Commercial High Schools,* like the Government Zilla High Schools, all over the country, to teach for the Senior Certificate Exmination

and *Commercial Middle Schools*, to train boys for the Junior Certificate Examination.

3. *Scheme of Studies* to be the same as the *London Scheme* of commercial education with modifications—the course to begin at the 4 years' stage, other examinations to be 3 instead of 2. Among other subjects an Indian Vernacular together with a modern European language

4. *Aid of the University*—(*a*) to recognise the College for the final test and grant a Diploma in Commerce, and (*b*) to add a group of subjects (commercial) to the curriculum of school final examination.

5. *Aid of Government*—(*a*) to recognise these Certificates—Junior and Senior—for the public service; the public service certificated men of these should be eligible for employment in the Customs, Excise and Account branches of the service.

6. *Aid of the Mercantile bodies*—to prefer for employment these certificated men.

7. *Funds*—Fees, charitable and other endowments, Government grants and Municipal contributions.

Such is a brief outline scheme we would like to lay down. It is framed on lines suggested by a study of the various systems of commercial education in European countries and with due regard to our wants and condition. We feel confident that every true patriot would recognise the necessity of providing for our youth suitable scientific training for commercial pursuits NOW or NEVER.

FOREIGN COMPETITION

The aim of every country should be to depend largely upon home markets—to retain for home consumption sufficient raw materials and to send away to foreign countries the surplus products. But so far as India is concerned the situation is quite different.

We export raw materials such as cotton, jute, oil-seeds, hides, skins, &c., and we import from the foreign countries cotton woven goods, woollen goods, silk fabrics, &c., manufactured there for our use. What can be worse than this, that we should export our raw products in large quantities and, what is worse still, that we should import articles manufactured out of the same stuff we have exported, with the result that while Indian artizans die by thousands, Indian gold fills the coffers of the foreign manufacturers! What an alarming increase of exports over imports during the last three years

i.e.,up to 1906-07 ! The following list will give the readers an idea of it .—

EXPORTS.

	1904-05.	1905-06.	1906-07.
	Rs.	Rs.	Rs.
1. Cotton ...	17,43,46,872	21,33,29,690	21,96,56,729
2. Cotton Yarn and cloth .	11,64,31,908	14,42,54,998	12,16,87,933
3. Wood and Timber ...	78,41,754	89,60,168	83,17,434
4. Raw Jute ...	11,96,56,462	17,12,56,641	26,83,86,810
5. Jute Manufacture ...	9,93,88,676	12,44,79,844	15,71,62,303
6. Wool ...	1,89,16,747	2,11,47,283	2,42,65,408
7. Rice ...	19,62,04,232	18,63,81,436	18,52,61,851
8. Wheat and wheat flour	18,59,82,302	9,17,27,260	7,84,34,285
9. Seeds ...	14,41,08,555	10,60,92,267	13,01,94,999
10. Oil ...	1,00,30,678	81,68,253	69,85,964
11. Tea ...	8,46,54,867	8,84,76,037	9,86,62,354
12. Coffee ...	1,66,09,757	1,75,67,240	99,64,778
13. Opium ...	10,62,34,442	9,47,17,667	9,30,79,224
14. Indigo ...	83,46,073	58,63,777	70,04,773
15. Hides & Skins	9,90,58,558	13,75,71,140	15,34,87,698

IMPORTS.

	1904-05.	1905-06.	1906-07.
	Rs.	Rs.	Rs.
1. Sugar ...	6,90,27,319	7,77,45,199	8,73,81,114
2. Provisions ...	2,16,57,985	2,38,56,186	2,42,33,411
3. Liquors ...	1,87,39,733	2,01,78,125	1,85,63,828
4. Spices ...	1,03,23,550	1,01,05,885	1,43,92,903
5. Tea ...	18,96,015	18,34,928	16,14,880
6. Cutlery ...	14,95,436	14,05,128	14,08,040
7. Unspecified Hardware ...	1,76.70,954	1,66,88,216	1,94,25,763
8. Earthenware and Porcelain ...	29,31,813	33,60,781	38,99,824
9. Apparel including boots & shoes..	2,23,99,627	2,21,76,855	2,11,22,755
10. Toys and requisites for games.	27,73,715	29,11,559	28,61,703
11. Glass and Glassware ...	1,12,57,101	1,12,47,108	1,27,14,108
12. Matches ...	48,95,283	58,83,251	63,12,731

	1903-04	1904-05	1905-06	1906-07
1. Cotton woven and other goods ...	2886·9	3555 9	3901·8	3769·4
2. Yarn ...	214·2	248·8	342·5	322·3

Thus the readers will see that we pay the foreign workmen for finished products, while

we do not attempt to turn out the same in our own country and thus retain the wealth, which is unnecessarily drained away. Instead of supplying our wants ourselves and then those of other nations, we import to our incalculable loss the textile fabrics and certain articles of food and drink. If, on the other hand, these things are fashioned in India, the difference between the cost of the raw material and that of the manufactured articles with the freight for importing the same would substantially add to the wages of the workmen here, and the profits of the capitalists, and improve to an appreciable degree the miserable condition of the labourers.

There is nothing more injurious to a country than getting back for its consumption, the products finished out of its raw exports from a foreign country. Such a state of things should be checked at all costs. The more we would learn to utilize our raw produce, the more we would defy foreign competition and the better it would be for our material prosperity.

With the richness of the resources, which nature has bestowed on her, and with the cheapness of her labour to utilize them, India

can easily meet foreign traders on their own grounds and find both her necessaries and her luxuries within her own confines. It is no idle talk or subject of the day-dreamer.

We have plenty of raw materials, which should be utilized, and for this manufacturers, in the first instance, are wanted.

Of all the articles we import from foreign countries, something is known and attempted in the way of manufacture in India, but generally in such a crude, imperfect and limited way that for all practical purposes it may be said that the art of making them is not known. An ingenious and skilful native workman is not so rare as some people think ; *but he is the only one.*

To create an industry and to push it into the markets of the world, we want the technical knowledge, the capital, and the energy which will furnish forth large factories and workshops where the things that are wanted can be made by the hundred thousand, and on demand.

The important place in our import list must be taken by iron and steel and manufactures of those metals. Our imports of cutlery and un-

specified hardware amounted to Rs. 2,08,33,803 in the year 1906-07.

Next to cotton goods, these are the most important items of our import trade, and until the country is able to produce wrought iron and steel, and following thereon the articles made from those metals, India must remain in a backward condition from the manufacturing point of view. The raw material exists in abundance in various places in India, and coal and limestone are equally plentiful. We want to smelt and roll the iron, and we want foundries and workshops where the iron and steel will be worked into the machinery and implements required for industrial and agricultural labour and domestic purposes. The tools, cutlery and hardware now made in India are all of imported material. One of the exceptional cases is that of a man in Bengal who makes really good pen-knives. But he works by himself in his own house, declines to impart his own knowledge to others, and when the Government tried to get him to execute large orders for pen-knives it utterly failed. For all iron and steel work, and for the manufacture of

tools and implements, large capital must be invested and factories started, fitted with perfect apparatus and filled with skilled artisans. Isolated cottage industry is quite futile. Of other metals brass and lead are the most important. We are now exporting close on two million chests of tea annually from India, each of them lined with lead, every sheet of which is imported. We have lead mines in India and Burma which will never be worked to any advantage until the art of making lead sheets for tea chests is learnt, for it is mainly in that form that lead is used in India.

Of brass it is only necessary to say that though the natives make brass and brassware very largely, both the copper and the tin are imported. Copper does exist in India, but whether in workable quantity is doubtful, and tin can be had nearer than the Straits.

All the native manufacture of brass is done by actual hand labour and it either consists of pots and pans for domestic use or of what is known as art-ware. Of the multitude of things such as bolts, rods, bars, nails, screws, hinges,

handles, locks and so forth, made of brass, which enter into every-day use, there is no attempt at manufacture on a large scale.

The finer classes of cotton goods are now made only by hand-loom industry which is daily declining. The mills have laid themselves out of the manufacture of the coarser goods and to make the better qualities the machinery must be adapted to work the short-stapled Indian cotton which makes fine goods in the hand-loom but is not suitable for the machine-weaving of delicate textures. Probably a mixture of larger-stapled cotton will be required and this can be grown in India if the demand for it arises.

A knowledge of the European methods of dyeing, as applied to cotton, woollen and silk fabrics, is especially desirable. The imports of dyed and printed cotton in 1906-07 reached a value of Rs. 2,79,003 in Bengal only. The native dyeing processes are very crude though the results are often most pleasing, and if a really important industry is to be started, the European methods, which require the skilful application of chemical science, must be learnt.

For the production of the better classes of woollen goods hitherto Australian wool has been used. But it is doubtful whether this is a necessity except for very fine goods. For the general run of woollens Indian wool is suitable, and there might be a large industry in this direction. Nobody, we think, has given a thought to the manufacture of felt for hats and other purposes, though very coarse felts are made by hand labour. There might be a large export trade besides the Indian demand. The latter, however, would be very small unless a hat-making industry were started, and there is ample room for one.

We imported woollen goods in 1906-07 to the value of Rs. 4,41,247 in Bengal alone.

In silk goods, outside of a certain line, no attempt has been made to start a large industry. We imported silk goods in Bengal in 1906-07 to the value of Rs. 9,89,797. All the satins and velvets on which the embroidery of Delhi and Lucknow is worked are imported, and though silk, satin and velvet are much worn by the wealthier classes, the indigenous manufacture

of silks is so small and so limited in its character as hardly to deserve mention. There are about eight silk-weaving manufactories in India. The art of making velvets, plush and satin is almost unknown, so far as we are aware.

In jute goods other than bags and sacks, we should compete with the European mills (in England and on the Continent) where jute is worked into a great variety of tissues.

The glass now made in India is very common and bad. When finer glass is made broken European glass is melted, blown and rolled. There is no reason why fairly good glass should not be made. Our imports of glass and glass-ware amounted to Rs. 1,21,14,108 in 1906-07.

We imported matches in the year 1906-07 to the value of Rs. 63,12,731. Several match factories run by private enterprises in Calcutta, Ahmedabad and the Punjab, have been doing very good work since the days of the swadeshi movement. The safety matches turned out by the Ahmedabad factory and those by the factory started by our patriot Dr. Ghose are in

no way inferior to those imported from Sweden and Austria. It is a pity that our countrymen should still use foreign matches.

APPROXIMATE DAILY INCOME.

200 gross Match Boxes, to be daily turned out, selling price at 9 annas per gross	Rs.	112-8-0
Deduct expenses	„	86-0-0
Daily profit	„	26-0-0

DAILY EXPENDITURE

	Rs.	A.	P.
Coal, 25 mds.	6	4	0
Wood, 12 mds.	3	0	0
Chemicals	37	0	0
Factory Establishment	20	0	0
Office do	5	0	0
Paper, printing	5	0	0
Contingencies	2	0	0
Agents' Commission	7	12	0
	86	0	0

Thus we see that with some initial expenses for purchasing necessary machines and applian-

ces a match factory may most profitably be worked in our country.

The paper mills are beginning to produce the better kinds, but the best paper has not yet been made. In Europe the glazed paper is manufactured from wood pulp, while our Indian mills keep to using rags, old linen, &c.

Our paper mills, we are aware, do not turn out cardboard. This may seem a small business but is really a large one. All the railway tickets used in India are imported, and there are already something like 130 millions of them consumed annually. The value of the imports of paper and pasteboard amounted to Rs. 80,11,105 in 1906-07.

The manufacture of type has been very successful at the Government Printing Office in Calcutta, and there is room for a considerable industry in the manufacture of most kinds of printing material.

Soap also is being made by many private enterprises and some success has been achieved in producing better class by the N.-W. Soap Co. and some Companies in Calcutta. The "Bengal

Soap Factory," in which native capital and native labour have been employed, is doing very excellent work. We have examined some of the soaps turned out by the Bengal Factory and we are no doubt pleased with them. We wish this industry success. Soap-making, like bleaching and dyeing, requires the application of chemical knowledge to the manufacture. We export great quantities of leaf tobacco and leave it to be manufactured in other countries, while we import a considerable quantity of manufactured European and American tobacco.

We imported umbrellas in 1906-07 to the value of Rs. 18,85,939. For the manufacture of these we want, first of all, that steel should be manufactured in India, and secondly, the silk and cotton coverings for the ribs.

We export caoutchouc largely in the raw form and import it more largely still in the shape of various manufactures. As mills and factories increase in India, so does the use of imported Indian rubber sheeting, belting, &c. But India is absolutely ignorant of the art of rubber manufacture.

We imported sugar to the extent of Rs. 8,73,81,114 in 1906-07. It is, however, a good sign of the times that some sugar factories run by private enterprise at different centres in India are all doing well.

We export millions of tons of oil-seeds, and hardly any oil to speak of, and we imported in 1906-07 14,79,799 rupees worth of vegetable oils in Bengal. And nothing need be said of mineral oil, which we imported in 1906-07 to the value of Rs. 21,81,497 in Bengal because our only sources of petroleum that have as yet been found to pay are those in Upper Burma, and the attempt made at Akyab to refine petroleum there failed in competition with the American oil, the price of which has fallen quite fifty per cent. within the last few years.

Candle-making since the days of the Swadeshi movement began has worked well at different places in India. But there is a very large consumption of imported candles, especially in Burma—where they are used in the pagodas—and there might be a considerable export trade.

Close on half the whole quantity of rice we

export to Europe, or, say, at least 50,000 tons, is converted into starch, which we might make for ourselves and export instead of shipping the grain from which it is made. Nothing is known about this industry in India.

We export large quantities of gums for use in varnish and horns and coir also in great quantity.

India abounds in fish but nobody has ever attempted to push the fish trade on a large scale by calling to aid the art of preserving and tinning which is quite unknown.

It has only to be added that the foundation on which manufacturing development in India must rest is capital, and capital has always been found very difficult to get to flow into these channels. The Indian artisan is poor, he expends vast labour and time in the production of things slowly by hand labour, which ought to be produced in a factory with the aid of machines. We do not refer here to art work but to the manufacture of things of every-day use, for the cheap and efficient production of which factory labour is essential. If the youth of the middle classes could be got to take

advantage of commercial education, perhaps the reluctance to invest money in industries of which now a more or less profound ignorance prevails might be overcome by the desire to turn to good account the knowledge obtained and by that a spirit of co-operation. There can indeed be no stronger proof of the "Power that waits on knowledge" and science applied to the service of industry and commerce than the remarkable progress of Germany achieved in recent years against heavy odds.

Here we have only to take note of the fact that it is the disciplined competition of Europe that we have no strength to meet, and if we mean to hold our own in the field in the presence of such competition, we must no longer allow ourselves to be unarmed and unequipped for the contest.

THE YOUNGER GENERATION

The "war of the future," said Lord Rosebery, "is a commercial war." Hence the question arises in what direction our national energies are to be increased in order to meet successfully such a strife.

In the arena of commercial conflict, the times require the fitting of younger generation with manufacturing, industrial and commercial capacities.

We have numerous unexplored resources, which education alone on right lines can successfully develop.

Without it we cannot hope to maintain the ground—turn into account our exceptional natural wealth. With right education in the right place we may become the most influential, prosperous and enlightened people in the world.

There can be little doubt that one of the weak points in our present educational system is the absence of practical element in it.

The training imparted in our schools and colleges does not at all serve to turn out men fitted for practical life ; on the other hand, it destroys some of the faculties essential for a practical life of business.

As a result of such a training the Indian parent only sees to the necessity of training his child for a clerkship or some of the professions, such as Law, Medicine and Engineering.

But the inevitable state of things—the increase of population, the decreasing prosperity of the land—demands that there should be other fields of action for the youth of this country than the clerical service and the professions of Law, Medicine, etc.

The progress of society, the opening of foreign markets, and the competition of the Europeans in every branch of trade and industry require of us a higher order of practical capacity.

It is here that India lamentably fails. When we feel that the natural resources of a country can be developed by its enterprising men and women, when we see around us that the highest ideals of civilization can be attained by the cultivation of mental and practical faculties and when we find India lacking in all these virtues, it then becomes a matter of supreme importance to educate our young men in such a way as to ensure our national prosperity.

From his defective training, the youth in India is ashamed of commerce and manufacture, and the society, composed of such elements, naturally feels an aversion to a man of business.

The pity of it is that the so-called 'educated' young man of this country in ninety-nine cases out of a hundred has starved his spirit while he has fed his memory; he has learned to lay hold of what other men have taught, but he has not learned to teach himself ; he has learned to steer by the light of other vessels, but he has allowed his own light to go out.

What is this all due to ? We, on our part, are inclined to account it to a defective education.

To know the value of moments; to do the right thing at the right time, and in the right way; to conceive new ideas—to make them work steadily, methodically and patiently; to sift and test again and again the results produced are what a sound system of education can do to make possible.

How many of the finished products of our schools and colleges have been thus trained? Very few it is to be feared.

If India is to rank with the nations of the world, her children should learn to move with the times and follow the examples set by progressive countries like America and Japan.

We may hope that when the thought of the nation has once been educated towards practical things great progress will be made.

Let us look closely then into the matter of training our young men, who are, so to speak, the trustees of the future progress of the country and patriotic citizens might do well to consider whether this is not work in which they might take a leading part.

The first lesson to be learned is the need for

combining thoroughness of method and attention to detail. The theory of business as well as its practice, the principles underlying sound trading, the conditions governing a particular trade or industry in production, organization and distribution, in India and abroad, should find a prominent place in the syllabus of studies.

Next a thorough scientific and technical knowledge is to be imparted, if our aim is to restore the material prosperity of the land.

It is one of the most important factors in bringing about the regeneration and prosperity of the country. In modern days, it is almost impossible to shine in arts and manufactures without the practical knowledge of Chemistry and Physics. How Chemistry turns waste into useful products things once thrown away are now made fit for human use by the practical application of chemical laws. How Physics is ready with its sister science Mechanics to construct big machines that have marked an epoch in the history of the civilization of mankind, how it has rendered electricity useful to man all round, so a thorough knowledge of Chemistry and Physics is highly essential.

There under the thick crust of the earth are to be found rich mineral ores.

Chemistry steps in and extracts the metals from the ores.

In England not long ago there was discussion that the Germans were superseding the English in arts and manufactures.

It was found out that for every man well up in arts and sciences in England, there were 31 men in Germany and it is due to this, the high scientific education of the Germans, that the British commerce is losing ground before the rapid strides of Germany.

Look ! how the manufacture of indigo by chemical process has dealt a deathblow to the prosperous indigo plantations of Bengal and Behar.

Observe what the genius of chemical science has done for Europe and what it may not do for India. Watt, by a clear insight into the doctrine of latent heat, resulting from his thorough knowledge of Chemistry and seconded by mechanical skill, taught the way to bring the steam engine into perfection. Wedgewood,

by the same knowledge advanced the art of manufacturing Porcelain, neither must we forget to mention Scheele's discovery of Oxygenized Muriatic acid and Bethollet's application thereof to the art of Bleaching, nor Davy's Chemical process which brought into perfection the art of Tanning and the preparation of Leather.

Chemistry is the foundation of those arts which furnish us with Saline substances—an order of bodies highly useful in the affairs of common life. The successful manufactory of Glass and various kinds of Pottery, Matches, Soaps, etc., require the Chemical knowledge of the substances employed, of their possibility as affected by difference of proportion, or by the admixture of foreign substances, and of the means of measuring and regulating high degrees of heat. The Chemist Bergman taught the most successful manufactory of Bricks and Tiles. Dyeing and Printing are processes of Chemical Operations and we need not tire our readers by giving further illustrations of the utility of this branch of science. If national prosperity in European countries owes its origin

to a superiority in the production of her Arts, ought they to be neglected in India ?

If not, we may boldly put the question—are we not, as having the welfare of India at heart, bound to promote the cultivation of science by diffusing scientific knowledge widespread among the youths of this country.

What soil in the whole world is so rich in productions as ours, and so calculated to yield all that is now obtained from foreign countries?

In these days no secrets are kept concealed in the industrial world. No sooner is a discovery made than it becomes the immediate property of every one. Every country may reap its advantages. If this discovery be important, if it be destined to introduce radical changes in the relative conditions of power and influence of the nations, each must adopt it ; for, if our rising generation remain stationary, if it do not take care to advance in the sphere of progress in the same degree with the foreign competitors, in influence and wealth, then India will never obtain the power of interfering with dignity in the destinies of the commercial world. Those nations who were too slow to receive the

new facts which the efforts of Science had disclosed have had to pay dearly for it. Why did Venice lose that ascendancy on the sea which she had enjoyed during four or five centuries, if it was not for the fact that the discovery of Cape of Good Hope having thrown open regions until then unknown to commerce, she remained an inactive spectator of the revolution.

Why have the two great nations, Spain and Portugal,—once so prosperous—since fallen if it be not that they slept over their riches and left other nations to invade the openings they had made. So in this continual and peaceable conflict of opposed interests, the answer to the question whether we are to remain weak or strong, to occupy a position of importance or insignificance will depend on our understanding of the times, our appreciation or miscomprehension of the drift of events.

A country may be levelled down by idleness and ignorance but it can be levelled up by industry and intelligence.

People forget that the training of youths in the industrial development of the country is

a more pressing need than the training of them for high posts.

The growing poverty of the people has created a demand for Scientific and Industrial education such as can be obtained by a regular course of study in well-equipped Institutions or Factories.

To secure good administrative posts may be a good ambition for the few, but the spread of Scientific and Technical knowledge is an object which is of immediate and overwhelming importance to the whole people. The ancient arts of India are dying out and can hardly take root owing to the severe competition of Western manufacturers. A knowledge of the latest processes and scientific principles has become indispensable, so far as our young men are concerned. They must be up-to-date and well-equipped if they wish to survive the present struggle for national existence, then only it will be possible to turn out Indian articles of the best and cheapest kind, which will be bought not only by the Indians but by the English and people of all nations. Manufactures cannot be "boycotted." They will find their way into all lands, in spite of even the most restrictive tariffs.

The question is—in what way can scientific and technical education be thrown open to the youths of India?

To attain to this end, capital, in the first instance, and well-trained teachers, in the second, are urgently needed. Although we have ample evidence of the conspicuous zeal shown by the Government—and for this we are thankful to Lord Curzon—to foster amongst us a desire for efficient technical training, and to provide the people with the means of attaining it, we should not, as citizens of the empire, individually neglect to contribute our quota towards the material welfare of our motherland.

If the grand movement started in Bengal meets with success, which let us hope it will, and if the Government start the operation of the late Mr. Tata's unexampled benevolence, provision will no doubt be made for an extended education of the youths of this country.

When sufficient funds are forthcoming a host of young men, energetic and enterprising, should be sent to foreign lands to learn industry in Factories and Institutions where they can best be learnt.

On their return, they should be provided with sufficient capital to establish Factories and set up Colleges for the training of the youths of this country.

We recommend the following manufactures for being carefully mastered in foreign countries by our young men; and thereafter the opening of institutions in India, where they may be successfully and profitably taught :—

Class I. INDUSTRIES

REQUIRING CAPITAL AS WELL AS THOROUGH SCIENTIFIC KNOWLEDGE.

1. Manufacture of Alkalis.
2. ,, of Medicinal drugs.
3. ,, Soap.
4. ,, Sugar.
5. ,, Oil, Varnishes and Painters' colours.
6. ,, Candles.
7. ,, Paper.
8. ,, Pottery.
9. ,, Glass.
10. ,, Tanning and Leather-dressing.
11. ,, Clocks and Watches.
12. Mine Surveying.
13. Raising and preparation of Ores.

14. Marble and granite quarrying.
15. Dyeing, Cotton, Silk and Wool.
16. Bleaching and Calico-printing.
17. Cutlery work.

CLASS II.

REQUIRING SCIENTIFIC KNOWLEDGE BUT A LITTLE CAPITAL.

1. Electric lighting.
2. Electro-metallurgy.
3. Metal enamelling.
4. Condensing milk.
5. Distillation of perfumes from Indian flowers.
6. Discovery and manufacture of economic products from trees.
7. Tinning fish.
8. Making felt for Hats.
9. Refining Indian oils.

The list of the Industries given above is a fairly exhaustive one—industries which are of daily use to us and for which we so largely depend on foreign manufacturers and which might be profitably introduced in our country.

But for extending the industrial field of India, a spirit of enquiry and enterprise has to be

excited among the youths of the country. The growing despondency and the cloud of despair hovering all round should be dispelled, encouragement and enthusiasm should be diffused widespread and this is the work of our great Leaders of thought and the Press.

Let our younger generation realise that this is the largest empire in the world—the store-house of the most valuable and precious ores—the greatest repository of diamonds hitherto discovered, a country rich in cotton, silk, spices, drugs, colours, saltpetre, saffron, coffee, sugar, rice, etc., that its animal and vegetable productions, its metals and minerals are scarcely yet known and are simply awaiting the Scientific explorer and the Industrial hand to throw their prolific bounties.

Is it extravagant to hope that India will one day become the greatest commercial nation ? Certainly not.

The task is with our young men who must erert themselves to solve the problem and thus exect the fabric of our future prosperity on a permanent basis—by energy and diligent labour of head and hand.

We need only to look to Japan to see what a country may become which works its brains and hands.

Many of us cry for external help, but the help must come from within.

"Heaven helps those who help themselves" is a saying not at all worse for the wear.

The difficulty is not to be got over by lamenting about it, or by staring at it, but by grappling with it and overcoming it. It is deeds, not words, that are wanted. Employment for the mass and national prosperity must spring from the people themselves.

So let our youths feel the full responsibility of their share in the country and act with energy and enthusiasm.

God has endowed men in Europe as in India with reason, will and physical power, and it is only by the application of these to patient industry that they can open a pathway to the enduring prosperity of the country.

There is no "Eden" in nature. The earth might have continued a rude uncultivated wilderness but for human energy, power and industry. They must conquer who will. It is

therefore of the highest importance that attention should be directed to the improvement and strengthening of the will ; and "the right time," says Locke, "to educate the will is youth " ; so mental training must not be overlooked, for it has been wisely said,

" Mind will rule and matters yield
In senate, camp, tent or field."

There is a certain season when our minds may be enlarged, when a vast stock of useful truths may be acquired, when our passions will readily submit to reason, when right principles may be so fixed in us as to influence every important action of our future lives. But the season extends neither to the whole nor to any inconsiderable length of our continuance on this dust-clad star. It is but limited to a few years of our term, and if throughout the time we neglect mental training ignorance is sure, according to the ordinary course of things, to entail upon us.

A resolute Will is needed not only for the performance of difficult duties, but in order to go promptly, energetically and with self-possession through the thousand and one difficulties which stand in the way of fighting for the

country, we mean, in the industrial and commercial sphere.

But these difficulties and hindrances must be set at naught by the feeling of duty and the power of Will, at whatever sacrifice of worldly interest.

Young men of India ! India's salvation lies in your hands. She expects every man to do his duty. Let your hearts bleed for the degeneration of your country. You have much to do with your times and means and show to the world that your existence is of some use. Awake—arise, gird up your loins and manfully set about the regeneration of your land of birth. When you *will* to serve your motherland in some practical way, you will undoubtedly be carried through your action by some unforeseen pleasure or unexpected happiness. Remember, there can be no bliss greater than an energetic action on your part to ameliorate the condition of your country. And when you complete your work, you will find that all the pains of your labour have been amply rewarded and your triumph will be consecrated by the restoration of India's greatness as a prosperous, happy and loyal nation.

ADVANTAGES OF TRADE ON THE JOINT STOCK PRINCIPLE.

The spirit of commercial enterprise, which has of late been re-awakened in this country, may be viewed as a reaction following the torpid influence of Moslem rule. Trade on a very extensive scale had flourished here long before the Afghan hordes made India their home ; and it was pursued with zeal even for sometime after the country had tasted the bitter cup of foreign domination. Not to mention the historical records of old Hindustan, its very folktales inform us that merchants were here held in great esteem. In status they ranked next below the prime minister, and above the head of the executive police, and were fit associates even for kings. The heir-apparent to the throne, the *Rajputra,* had a boon companion in the merchant's son, the *Suddagarputra;* and the merchant was one of the most important factors in the royal court.

Fitting out mercantile expeditions to foreign shores was the order of the day ; and ships laden with valuable Indian articles visited the parts of the world then known, and established friendly commercial relations with them. But when the Mahomedan yoke rested with all its weight on the neck of the vanquished Hindu, and the spirit of enterprise was almost crushed in him, he was obliged to give up foreign trade. He became fond of tangible wealth in the shape of land alone, which no freebooter or oppressive ruler could easily dispossess him of, of money which he could with little difficulty secrete in holes dug in the ground or in the wall, and of jewellery which the females of his house, immured in the zenana, could safely carry on their persons and which therefore escaped public notice. There was then little or no intercommunication, and a man seldom ventured beyond his own domicile or fields. He had to remain content with his own private concerns, not caring for the state. Again, the productions of the country, instead of being used for the benefit of those who grew them, were in most cases misappropriated by those in authority, to pander to their luxury.

But those days, under the wise dispensation of Providence, are now buried in the past ; and we live at a time when the people, roused from their long torpor, have commenced again to appreciate the blessings of trade and to push it on in some degree, though their resources are very small for the purpose. There are at present petty trading establishments almost all through the country ; but they are apologies for like concerns in Europe, or those here under European management. To sum up:—there is a wretched attempt in this country at inland trade, and none whatever at foreign commerce. And it may not be out of place here to point out what seems to be at the root of such a state of things.

The first and foremost obstacle in our way is want of sufficient capital. The only capital that a man can command lies in his coffer, or the bank he deposits money in ; and in most cases it falls much short of what he should raise for the purpose. What should he do in a case like this ? One may say he can borrow money from some capitalist. No : this is not a safe policy ; or what with the interest—always high—on the sum borrowed, what with the uncertain returns

of the business, the undertaking may turn out unprofitable or even prove a failure. Again, the rich in the country look down upon trade as a low pursuit ; and the poor are unfitted by their position to follow it. It must therefore be the occupation of those forming the middle class in society. And who among these can raise sufficient capital ? We want thus a body of men to create a fund by joint contribution for any trade they may have in view. Yes, the adage " Union is strength" holds good in this as well as in other pursuits of humanity ; but the question turns up, how is this union to be effected ? By simple partnership, as it is commonly understood ? No. Though such relations are to be met with in our country, and they may be conducive to the growth of sufficient stocks, yet there are inconveniences attending them. Partnerships are constituted on the principle that each of the members is responsible for all the debts, and that all of them have to unite in instituting or defending a process of law—a state of things that may entail considerable liabilities without corresponding advantages. For instance, A, B and C are part-

ners in any trade. They put in a thousand rupees each, with the understanding that each will have only one-third of the profits. Their joint business goes on well, say for two years, each receiving a yearly dividend of 200 rupees—comparatively not a poor rate. But in the third year, the business takes a bad turn and fails ; the partners have to wind it up with a debt of 5,000 rupees. A and B have no sources whence to pay their shares of the debt, or somehow or other avoid paying them ; so the whole liability rests on C's head, on whom singly the creditors have as much hold as on the three together. Poor C, in addition to the 1,000 Rs. he advanced in the business, has now to pay the 5,000 rupees, when his profits have amounted to only 400 rupees. Is not the business a great loss to him ? Again, suppose the contrary: the concern flourishes without interruption, and in time the partners grow into rich merchants, having many as their debtors. Some of these prove dishonest and are therefore to be sued. The law requires that A, B and C must unite in the process. But B and C are not in the country at the time, nor have they left any

legally empowered proxy: and the result is that no suit can be filed till the return of the two now absent, which may not happen within the time allowed by the Limitation Act. The realization of the debt becomes then an impossibility, and well may A, B and C rue their union in the speculation, without making sufficient provision for such emergencies.

Again, in partnerships of the kind noticed above, a sufficient fund cannot be raised without exposing the members to considerable hardship. They have each to contribute a pretty large sum ; for the system under which they put their shoulders to the wheel does not admit of the disposal of shares, and the consequent accession of new members to the business. This brings us to the constitution of joint stock companies to promote the interests of trade. This is the only step we can take for the purpose; and we will in this article dwell on the formation of such a Company, the obstacles in the way of our introducing it into our country, and the method whereby we can get over these obstacles.

A Joint Stock Company, whose vast proportions and wide ramifications are among the

most striking features of modern industrial life, is comparatively of modern origin in England. The common law recognized no privileged associations except those incorporated by charters or statutes. All other associations were assemblages of individuals, and a trading association was at best a partnership, with all its inconveniences mentioned above. The question now arose if such an association could be changed into an incorporate body ; and after much thought on the matter, it was concluded that no such body would supply the desideratum, for its members would be irresponsible for its debts—a circumstance which instead of promoting the end in view will hinder its enhancement. For fostering the growth of trade, such a society was required as would be able to sue and liable to be sued as a corporation, while its members remained responsible for its debts ; and as the system of Joint Stock Companies met the requisitions, it was adopted in English mercantile concerns, in spite of the hostile attitude the legislature for some time maintained.

A Joint Stock Company, then, may be defined

as a partnership in which a number of persons contribute funds for the purpose of carrying on a trade or other profitable object, with this provision, that its members be responsible for its debts, and the society be able to sue or liable to be sued as a body. For a company like this to work efficiently, the partners or sharers must elect an executive committee of directors who will appoint a manager, and the Company itself will under certain circumstances be able to reduce the capital or part thereof into shares of a smaller amount than that fixed at the time it started.

We hope our readers will be at one with us in admitting that the best thing that can be done to further the cause of trade in India will be the establishment of such Companies in large numbers. But there is a backwardness even among our educated men to invest money in joint stock business ; and as long as this backwardness will not be a thing of the past, trade must be the occupation of private individuals alone, separately or in very small partnerships, and there will be no development of larger schemes. The reasons for this backwardness, or

the obstacles to the formation of Joint Stock Companies in our country, are not very far to seek. They are given below, together with some friendly suggestions to the contrary.

We have already seen how, during the Mohamedan rule, the Hindu lost all his love for trade, and partly hid his money, and partly invested it in land and jewellery ; and we still see his descendants with the same predilection. Along with this, it is a mania with the rich—especially if they belong to cities and towns—to lay out money in Government stocks. In short, Indians are jealous of their wealth, and have a dread to be known as rich. But they should understand that times are altered, and they ought to be alive to their new opportunities. No longer does the mountaineer make his raids, the *naib* pour down with his myrmidons to divest the ryot of his moveables or the freebooter haunt the Gangetic valley in the pursuit of his nefarious trade. There is, therefore, no need for them to follow in the wake of their ancestors. Land is a valuable possession, but not so as in the days of old. Besides this, it is not now so profitable an investment as formerly. And as for jewels,

it ought to be known that they are very unprofitable possessions. It is a fact known almost to every one of us, that in making jewels of gold or silver, the metals are so adulterated that an ornament the preparation of which costs now a hundred rupees, when sold a few months afterwards, will fetch at the most two-thirds of the sum. Let our friends, then, with all their love for landed property and their anxiety to decorate their wives, find for themselves a better way of investing their wealth—better for themselves and their country : let them be ready to contribute to the development of its trade. Let them understand and intelligently carry out the system of joint-stock company; and in a short time, they will be able to congratulate themselves on their success in enriching their own iron safes, and giving their country a mercantile importance.

The Indians are a lending and borrowing people. The lender often charges interest at a high rate, and the borrower, forced by circumstances, puts up with the exaction. Money-lending, therefore, in India is very lucrative when there is good security in land or

jewellery ; and a man with means has a greater inducement to be a mortgagee or pawnbroker than a merchant. It is frequently seen that respectable men like landlords, clerks, schoolmasters and vakils, lend out money often on the documentary system ; but it is not rare to find some of these acting as pawnbrokers and making a good deal of gain.

To illustrate a transaction of the kind, let us suppose that one of them lends a neighbour Rs. 25 on the security of a golden bracelet, at the usual rate of interest of a pice per rupee per month, or at 18¾ per cent. per annum ; then the gain he makes is great indeed. And under such circumstances he will never care to invest his money in a mercantile concern, promising generally at the most a yearly dividend of only 10 per cent. but leaving its success or failure an open question.

But one word to those who are so taken up with the large profits of money-lending as not to care to give it up for shares in a profitable trade. You may think you are making a good harvest—better than any you could make by a commercial investment,

but you are wrong. For you can never have the opportunity of lending out your whole capital. Your clients come and go ; and you must always have some of it unemployed. Thus, although you may as a pawnbroker get an interest of $18\frac{3}{4}$ per cent. per annum, the percentage will be much lessened on taking into account the part of your capital lying as dead stock. But if you put your money into one or more Joint Stock Companies, you will find an investment for your whole capital,—and that without incurring any trouble. At present you have to go through the worry of much calculation and inspection ; you have to suffer interruptions in your daily work to attend to such as call for loans ; but *then* the manager and the directors will do everything for you.

Again, a money-lender's capital is always the same in value, while in mercantile investments the actual intrinsic value of the shares may increase. The success of the transaction not only brings in interest, but increases also the capital. Shares may now sell at par, but the investment proving successful they may sell at a consider-

able premium ; and in that case the capitalist's gains will consist of the interest added to the increment his capital has received. Companies are said to have made enormous gains in this way. This fact has been well illustrated by Mr. Glyn Barlow in his *Industrial India* :—

"Some six years ago, the shares in the 'Khatras Jheriah Company' (a coal mine in Bengal), could be bought at the par price of 10 rupees. Indian coal then came into demand, and the shares in the Khatras Jheriah Company ran rapidly up till they were bought and sold at 42, a dividend having meanwhile been paid at the rate of 40 per cent. per annum. This, however, was not all. The coal-fields owned by the Company were larger than the Company could conveniently work, and a part of their land was accordingly sold to a new Company, the Seebpore Coal Mining Company, which in payment for its purchase, assigned to each shareholder in the Khatras Jheriah Company, free of all cost, four shares in the Seebpore Company, valued at Rs. 5 each, for every four shares that he held in the original concern. The public demand for these new shares was

such that in a very short time the five-rupee shares were bought and sold at fourteen rupees. Consider the profits of a man who had bought ten shares, at a total cost of Rs. 100, in the original Company. His hundred rupees had come to be worth Rs. 420 ; besides this he had received a dividend of Rs. 40, and furthermore he had eight shares in the new Company worth Rs. 112. In that year his original Rs. 100 was represented by Rs. 572 ! What money-lender's profits can compare with this ! The Khatras Jheriah Company was soon one Company amongst many that found great success, but it was the most successful of them all."

The Indian is of a peaceful disposition unwilling to run risks of any kind—especially to venture on enterprises requiring investments of money in such a way as will leave little room for personal inspection. To lay out capital as the member of a Joint Stock Company, the affairs of which are to be superintended by others, is against his vein. Besides, his experiences of the working of such a Company are in no way encouraging. In 1890 it was rumoured by some adventurers that

there were gold mines in a certain district; and that if these were worked properly, they would disgorge masses of gold larger than any that even Crœsus beheld. Companies were formed. Men became mad to purchase shares, which day by day rose in value; when at last the bubble burst, there was no gold in the mines. Who can picture the disappointment of the shareholders? Not to speak of the poor clerk or schoolmaster that had, even by denying himself a full meal, bought in a share, the Rajahs and Nawabs who had built castles in the air gave vent to their chagrin in a thousand piteous ways. The speculation ruined almost every one concerned in it, save some of the originators who knew how to feather their own nests. Some eight years before this, Companies started to work the gold mines in the Wynaad in Southern India had met with similar disappointment. In this case, most of the sharers were Englishmen in England. The mines were supposed to have been worked by Indians in ancient times; and it was believed that these people had not gone very deep in their search after gold, that with modern improved apparatus

masses of this precious metal would be dug out, and that the shareholders would receive rich dividends. Work was begun in right earnest, with no eye to expense or labour. Some of the mines were worked, when lo ! there was not a particle of gold found therein. Equally mortifying is the history of some of the Joint Stock Companies started by the Indians themselves. Companies were formed for starting paper, glass or match manufactories ; they worked for some time with prospects of success, but eventually the enterprises failed, leaving many to rue their bad luck.

Is it then strange that the Indian capitalist is backward to invest his money in the hazardous enterprise of a Joint Stock Company ? No, the proverb " Once bitten, twice shy " is applicable in his case. He may, however, pluck some courage if the circumstances under which the gold-digging or glass, paper or match manufacturing Companies failed be explained, and he be told how to launch his capital so as to steer clear of the dangers in his way. In the gold-mining enterprises the capitalists suffered the Company's promoters to lead them by the nose

Men like these often give too glowing a description of the prospects of the concerns they befriend. They go about with clever agents at their heels and win the hearts of men with their sweet palaver, and at length get them to buy the shares. We advise our Indian investors not to be hoodwinked by these Company promoters, but to look and judge for themselves. Let them take our caution, and they will to a certain extent be safe. Besides, gold-mining business is very uncertain; for it is impossible to guess beforehand whether any mine said to be a gold mine, actually contains this metal or not; whereas *en passant* we may mention there can be no difficulty in determining the question with regard to a coal mine. Gold-mining Companies, then, cannot be expected to succeed in every case: and let not, therefore, the bankruptcy of any of these frighten one away from all Joint Stock Companies. When a man is called upon to buy shares in a Joint Stock concern, let him before doing so make himself sure that the Company is genuine, that the directors are intellectually and morally fit to be trusted, and that the scheme has chances of success ;

and if he does all this, then we can assure him of a very profitable investment.

As to the glass factories, &c., of which we have spoken before, their failure was not quite out of the way. They were started perhaps without a sufficient knowledge of the branch of industry selected. The workmen engaged may not have been experts in their calling, and there may not have been capital sufficient for the purpose ; in short, work may have been begun and conducted in a way not to command the confidence of the public.

Having given the three chief reasons for the backwardness of Indians to invest money in Joint Stock Companies, we draw the reader's attention to another point showing the utility of these associations. They enable every one of tolerable means to employ profitably some capital—no matter whether large or small—whereas private trade, singly or in common partnership as it now exists in India, has its blessings for those alone who can lay out large sums of money. Most men in India can buy a few shares in a Company, the price of which will never be much: but there are few who can command means for

opening business of their own, singly, or under the system of partnership now in vogue. A common clerk, for instance, earning only Rs. 30 a month may scrape the price of a share in the provincial railways or in any other Company, but in the present state of his affairs he cannot find money to open even a petty grocer's shop. If you talk of his doing business in partnership—that is also beyond his means, unless he be made to pay his share in work.

We have seen, then, some of the benefits of Joint Stock Companies in mercantile enterprises. We have seen, too, some of the obstacles in the way of our forming such Companies in India, and have shewn how these obstacles can be removed. One word more we have to say before taking leave of the subject—it is a word of advice to the *elite* and influential in the land. Having in their constant connection with the nations of Europe learnt what wonders Joint Stock Companies have achieved in the mercantile world, they should encourage the formation of such bodies among us. It will not do for them only to say that several Companies of the nature have been started

by our countrymen ; but they must each see that the spirit of joint enterprise is developed among the people at large. Along with the trumpet that is now being sounded for *Swadeshi* industry and arts, there must be blown another for *Swadeshi* trade on the Jont Stock principle ; and then the grand panorama of India's prosperity will not long remain in the distance. Let the educated among us go through every Indian village, as preachers of co-operative trade, and explain to the rich and the poor, the literate and the illiterate, the benefits of it. But words alone will not do; they must be backed by action. The educated should form themselves into co-operative bodies, and must show such intelligence and integrity of principles as are essential to the existence of these, and to their being appreciated by the people at large. A Joint Stock Company cannot be formed but with directors having capacity for organization and control, and such unimpeachable integrity as is calculated to secure public confidence ; so let the best educated among us in these respects act as directors in the new Companies that will be formed. At present there is very little sympathy between the educated and

the uneducated Indian, and the latter has very little confidence in the former. Let men of education, however, once show that they regard those without it as their brethren, and the gap between the two classes will be narrowed; and the educated and the uneducated, the polished citizen and the rough villager will work harmoniously to the development of the country's resources, industrial or commercial.

But when the common people will have seen the utility of Companies with Joint Stocks, they must not be hurried on to join one of these. They ought to be told to do so only when the speculation will have appeared promising. In short, the cultivated brains that take the lead in such matters should avoid inspiring people with a speculative mania. History tells us the evil consequences of this mania over the South Sea Scheme—which had in its view such chimerical projects as the extraction of silver from lead, and the importing of asses from Spain. When the idea of doing business on the joint stock principle has first been communicated to the villager, he should be advised before it is put into practice.

AMERICA AS A PLACE OF STUDY

The United States is probably the country most advanced in scientific and technical knowledge, and large numbers of Japanese students flock every year to the States for education. Life in the United States is also not very costly, and students can well manage to earn sufficient to maintain themselves during their studies. Again, in America, it is quite possible to subsist on a purely vegetable diet. Thus in spite of certain drawbacks America is a fit place for Indian students to resort to.

One of these drawbacks is the peculiarity in the national character of the Americans which makes them hate a black skin. A Bengalee student in America wrote to the *Sanjibani* sometime ago to say that Indians who have a Negro's black complexion should not think of going to America. The American antipathy to the black complexion is deep and implacable. This is due to the fact that for a long time and

up to a recent period the Americans (in the Southern States) used to keep Negro slaves under them. Though slavery has since been abolished in America, the Whites still take all black people for Negroes and hate them as slaves. They cannot make out the difference between Indian and Negro physiognomy. The student therefore thinks it very desirable that the Indians who intend to go to America for education should be of a fair, or at least not of a really black, complexion. He attributes the continued American hatred for the Chinese to the first impression they formed of the race, from Chinamen of the lower classes who were among the first visitors to America from China, and were taken by the Americans to be the models of the Chinese race. Owing to the virtual indelibility of first impressions, it is very important that the first impressions the Indians make on the Americans should be such as would create in their minds respect and love for them, and hence the earliest Indian visitors to America should have a pleasant exterior as well as a respectable and good interior.

The same student informs us that an Indian

going to America for study should provide himself with a purse of Rs. 500, from which amount the student can pay his passage as a deck passenger and yet have a good balance. By travelling as a deck passenger the student will be able to save Rs. 150, which sum must be shown to be in his possession in order that he may be permitted by the immigration officers to put his feet on American soil. There is a high-minded American gentleman named Myron Phelps in the United States, practising as an advocate of the New York Bar who has opened an Indo-American Society to provide board and lodging for Indians going there to study. Communications sent to him will be kindly answered. As steamers usually ply between Yokohama and Portland, it is better to go *via* Japan than by way of England. Indian coins should be changed into dollars at Hongkong, where the steamers from India on their way to Japan anchor for several days.

Young Indians going to America for education should not be younger than sixteen, should be in sound health and bear a good moral character. They should have been previously

educated at least up to the Matriculation standard of the Calcutta University.

That it is easy for an Indian student in America to maintain himself is evident from certain facts adduced in a recent article in the *Pall Mall Gazette*, which was reproduced in some Indian papers. We learn that in America the very humblest young men display an amazing anxiety to pass through one or other of the great universities and obtain a degree. "In some of the Evening Schools on the Lower East side of New York City, one may see men of thirty-five to fifty half asleep over their books and exercises after a long day's work in a Jewish 'sweetshop' . . . The same remark applies to factory girls and married women with families . . . . At Columbia University in New York City the energy of the poor students is so great that an employment bureau has been started for finding convenient temporary employment for hustling but penniless youth. Mr Myers, the Secretary of this bureau, informs me that the students are so keen, that even during the short Easter recess he placed twenty of them as assistants in a

florist's shop. 'During summer,' Mr. Myers says, 'hundreds of our fellows go to work in real earnest earning money which will help them through the University. This work may vary from tutoring to catering. I have just placed ten men in a hotel as book-keepers, stewards, and watchmen. During summer months, also, I placed a good many as Bank clerks and directors of summer camp for boys, but our students are by no means particular and will go from house to house selling things or as tram car conductors, and even as waiters of seaside and mountain resorts.' The students are often handsomely paid for their work and always well treated.

Thus there is no reason to fear that an Indian student in America will find it impossible to remain there without regular remittances from home. California, Washington and Oregon, again, are celebrated for the excellence of their climate, and there is no risk of our students being exposed to utter helplessness, as there are numerous philanthropic institutions and hospitals in the locality, of which San Francisco alone has forty-five. It is, therefore, to be earnestly hoped that our

enterprising and patriotic young men will avail themselves of the opportunities offered by a sojourn in America to master the arts and industries of the West, and that all such youths must be furnished with the requisite sum of Rs. 500 by their friends and neighbours when required.

From a circular issued by Mr. G. Mukerji, it appears that in the United States an educational institution means an academy where every kind of education is imparted with special reference to a particular branch or profession. A University means a nucleus of different colleges, such as colleges of literature, politics and economics. Our students can learn enough to greatly benefit their country if they join a college of engineering or a college of agriculture. A college of engineering consists of civil, mechanical, electrical, mining and chemical engineering ; a college of agriculture includes botany, zoology, bacteriology, physics, chemistry, irrigation, stock-breeding, &c. Applied chemistry and applied mechanics are the principal things for all technical industries, and for these elaborate workshops are provided in the colleges where the boys get their instruction, and great atten-

tion is paid to increasing the practical ability of the student. Applied chemistry or chemical engineering embraces the widest range of industries, as by it we practically learn all industries, such as the manufacture of glass, porcelain, cement and rubber, dyeing, electro-plating &c., and a complete course in this branch of knowledge ensures success in any chemical or mechanical manufacturing.

American teachers are highly cosmopolitan in their manners and habits, and Indian students enjoy equal privileges with the other students in the country. Mr. G. Mukerji calls American teachers the " uncanonized saints of the modern age."

In general, all State universities are free. Each State has its own university, high schools and polytechnic colleges. The University is located on the same ground in different buildings, producing an ennobling and grand influence on the mind and character. Sanitary rules are enforced around it, and no intoxicant liquors are sold near the place.

The State of Washington has an efficient University at Seattle, and an Agricultural College

at Pullman. Oregon has the State Agricultural College at Carvallis, about one hundred miles from Portland. Here are taught electricity, mining, mechanics, agriculture, and other practical subjects. This College is considered the best on the Pacific coast. The State of California has two very efficient Universities ; first, the State University at Berkeley, and second, the Strandford University at Palo Alto, about forty miles from San Francisco.

The average expense of a student should not exceed 15·00 dollars or 25·00 dollars per month, which sum includes board and lodging, laboratory, books, &c. Students staying together can reduce the expense to one-third by making their own arrangements for cooking. As all kinds of vegetable food are abundant in the States, students can easily live in orthodox Hindu style if a number of them form themselves into a nucleus and go over to America. This mode of living is often adopted by the Chinese and Japanese students, and is also very economical and convenient.

Although four years are required for graduation, advanced students can shorten the time by

completing the studies sooner, and full credit is granted to all studies previously conducted. Students intending to proceed to America should be provided with a certificate from their teachers mentioning the subjects of study previously concluded, and recommendation as to their good moral character. They should also be able to understand the English language thoroughly. Full information about passage arrangements can be had from Messrs. Thomas Cook & Son, the Maritime Messagerie and the Nippon Yussen Kaisha, at the different ports of Colombo and Bombay. At San Francisco also, Dr. Gilbert, an Englishman naturalised in the United States, has also started a Home for Indians, to be located near the San Francisco College, to enable Indian youths to live at the lowest possible expense, and will be of great help to the youths. Thus it would seem that the existence of an Indian youth in America is as safe as in India.

Does it not then behove our enterprising young men to go to America to master the arts and industries of the West? Millions of people in India now never know what it is to have their hunger

fully satisfied. Scientific agriculture will enable us to double the produce of our soil, and technical knowledge will be the means of reviving our industries, despite the keen competition of occidental nations. America, the home of these, should therefore be largely resorted to by the young hopefuls of the country.

In conclusion we are glad to note that the authorities of the Dayanand Anglo-Vedic College, Lahore, have instituted a Foreign Education Scholarship Fund with the object of sending young men to America for industrial training. The project will be worked on the lines of a similar scheme in existence in Japan, the scholar selected being given his passage and other necessary help, and earning his own livelihood while he remains in the United States. Lala Lajpat Rai has subscribed Rs. 1,500 towards the Fund. We hope other Colleges and High Schools in India will follow the example set by this excellent Lahore institution. There is also in Calcutta an Industrial and Scientific Association who send away our young men to foreign lands to acquire

technical and scientific training. Its President is Mr. Norendra Nath Sen of the *Indian Mirror*, and its Secretary Mr. A. Chowdhury, 139, Old Ballygunge Road, Calcutta.

HOW INDUSTRIES ARE DEVELOPED.

We have repeatedly pointed out that protection is necessary for the development of infant industries. As the importance of the subject cannot be overrated, we hope we shall be excused for reverting to it once more. Here we propose to consider the question from the historical point of view, indicating the part played by protection in developing the industries of two of the greatest European countries—England and France, in the hope that our countrymen will be confirmed in their resolution to voluntarily protect *Swadeshi* industries.

Ever since the time of Cromwell, with the solitary exception of the rebellion of Monmouth, England has enjoyed internal peace, and she has utilised this circumstance for raising herself to the position of the foremost manufacturing and

commercial nation in the world. So long as her industries were in an infant stage, she uniformly followed the policy of protection and prohibition of foreign goods, a policy which we are only beginning to learn. Her acquisition of Empire, which has greatly helped her industrial development, was in a sense the result of her commercial enterprise, the primary object of the British going out to foreign countries having been to extend their commerce.

During the Stuart period England was engaged in a fierce struggle with the Dutch, the objective of which was to snatch from the latter the monopoly of the East Indian trade. Her unqualified success in wrenching commercial supremacy from Holland was in great measure due to the remarkable statute of Cromwell known as the Navigation Act of 1651. "The Act provided that no merchandise, the produce of Asia, Africa, or America, should be imported into England in any but English-built ships commanded by an English master, and navigated by a crew three-fourths of whom should be Englishmen, nor any fish exported from or imported into England or Ireland, except

of English taking." By this Act, vigorously enforced, English trade with foreign nations received an immense impetus, a great shipping industry was created, a race of sea-faring men was bred for the nation's defence, and a new manufacturing industry of vast proportions was stimulated, the protected fisheries dotting the coast of England with thriving villages. Charles II, though he dishonoured even the remains of Cromwell, followed in this matter the footsteps of his great predecessor, and one of his first acts was to confirm the wholesome regulation of that noble usurper.

The policy remained in force during the eighteenth century, and English manufactures and commerce throve in consequence. Bounties were liberally bestowed for the encouragement of indigenous industries, and in every case they resulted in the development of the industry subsidized. Those shipbuilders who could turn out three-deckers, or vessels that could be employed in whale-fishing, were rewarded with money grants from the royal treasury. In 1700 the use of India-manufactured goods was prohibited by the imposition of a penalty of £5

for the wearer and £20 for the seller of such goods.

"In 1722 bounties were granted amounting to three shillings on the export of every pound of silks, four shillings on silk mixed with gold or silver and one shilling on silk stockings. Earnest efforts were made to foster the linen trade, both by granting bounties and by placing fresh duties on foreign linen manufactures, the proceeds whereof went into a fund for encouraging the home growth of hemp and flax." England continued to adhere scrupulously to the principle of protection down to the middle of the nineteenth century, when the increasing pressure of her population upon the soil as well as the writings of Cobden and Bright led her to repeal the Corn Laws and gradually to adopt a policy of free trade. Yet even to this day England protects her tobacco industry by imposing a heavy duty on Indian tobacco.

We do not mean to say that England's greatness in the fields of manufacture and commerce has been due solely to protection. Mechanical invention, the construction of a complete

network of railways, liberal use of steam-power and the admirable qualities of mind and body which Englishmen possess, have operated in the same direction. It is also true that after English industries attained such solidity as to defy foreign competition, free trade opened up new fields of enterprise to the English race, and placed new conditions of success at its disposal. Yet all these developments would hardly have been possible but for protection in the early stages of English industries.

We now turn to the effects of protection upon French industries and commerce. The Republic of France adopted protectionism in 1892, and so far from dealing a deadly blow to her foreign commerce—as was supposed by some during the discussion—the new *regime* has in a very remarkable manner developed the whole of her transactions with foreign countries and the position of her commercial balance. During the septennial period 1885-1891 the average annual value of French imports was £171,160,000, while the average annual value of the exports was only £136,320,000, thus leaving a yearly deficit of £34, 840,000 on

the average. It was with the object of reducing this huge balance that the fiscal legislation of 1892 was enacted, and its success in achieving the desired result has been remarkable. During the period 1892-1898 French imports diminished in value by £12,080,000, and the exports by £1,120,000. The annual commercial deficit of France thus fell from £34,840,000 to £23,880,000. During the period 1899-1905 the results were still more remarkable and stisfactory, for the annual average of French exports increased by £36,160,000, whilst the increase in the value of the imports—the natural consequence of the growth of French industry—was only £,23,520,000, thus reducing the average annual commercial deficit of France to £11,240,000. But the results of the year 1905, the last year of his septennial period, exceeded all expectaions, for in that year, for the first time since the introduction of the present system, in place of a commercial deficit, the value of the exports exceeded that of the imports by £3,520,000. The great French economist M. Edmond Theory observes upon the authority of these figures that the

initial cause of the development of French *commerce and industry* was the fiscal reform inaugurated in 1892.

Among the industries which have prospered since the introduction of the present system of protection in France, the most striking results are shown by mining, the iron and steel trades and agriculture. "The whole basin around Longway is one busy hive of industry and of prosperity," writes the Paris correspondent of *Commercial Intelligence*, "for while the profits of the masters have been excellent, the wages of the men have considerably increased." Reports from the various centres of industry show that work is plentiful; the bulletins at the Bourse testify to the fact that the shares of all the great firms are rising in price; while the cry of the unemployed has practically ceased to exist in all the great centres of the iron and steel industries.

As a result of the new fiscal policy France no longer depends upon foreign countries for her food supply, but is able to export enormous quantities of food-stuffs. At the time of the introduction of the present *regime*, France imported alimentary produce worth 450 million

francs more than what she exported to foreign countries. Since the fiscal policy of 1892 came into operation the balance against France diminished almost progressively until 1899, but from that year the value of food-stuffs exported has each year exceeded the value of the imports, the difference in favour of France amounting in 1905 to no less than 287 million francs. Such have been the extraordinary results of fourteen years of protection.

During its present protective *regime* there has been an all-round increase in the wealth of France, and this fact is demonstrated by the immense sums the population of France has been able to lend, both at home and abroad, sums which, during the last seven years alone, are stated to amount to £551,360,000. India resembles France in being mainly an agricultural country, and our policy of voluntary protection cannot fail to produce some of the beneficial results achieved in that country.

THE ORGANISATION OF CREDIT

So great is the influence of credit on the production of wealth that many political economists have been led to identify credit with capital. The credit of an individual is his power of borrowing, and of course this is something different from capital. Nevertheless credit is about as potent in fostering the production of wealth as capital. Thus, if a man has a great power of borrowing he can embark on any business,—manufacture, agriculture or shopkeeping, with borrowed capital. This borrowed capital, again, may be of such a nature that, but for the existence of credit, it would in all probability have been spent or hoarded.

Suppose that a person obtains a monthly salary of Rs. 1,000 out of which he saves Rs. 500, but on account of the unsettled state of the country or the general distrust among the people, he is afraid to lend this sum to some other person who has both time and opportunities for

carrying on business with it. In such a case he will either spend his saving or hoard it, thus rendering it of no use for the production of wealth. This state of things exists in several parts of India even to this day. Money is not generally lent out except on such tangible security as jewels, which respresent capital rendered useless. But in a country where there are public credit institutions like banks, the money can be lent to such banks, and a great part of it employed in the production of wealth; for banks lend out a great portion of the money deposited with them to persons actually engaged in agriculture, trade or commerce.

Again, suppose that a labourer earns eight annas in one day, and finds half of this amount sufficient to procure for him his necessaries. In the absence of credit he will most probably spend the other four annas also. But in European countries even such small sums can be saved, and accumulating in the labourer's hands can be lent out to a bank. The labourer is induced to save the money because the bank undertakes to give him an increment in the shape of interest.

In India the Government has established Post Office Savings Banks to encourage savings among the people, but unfortunately the agriculturists, who form the great bulk of the population, have very few dealings with these banks.

Again a considerable portion of the amount deposited with English banks represents the money which tradesmen and others keep with them to meet their current expenses. Thus suppose that a man gets a salary of £1,000 per annum, and requires the whole of this amount to meet his expenses for one year. He will not invest his money in any commercial undertaking, because he knows he will have to live upon it during the year, and will also be afraid te keep so much money with himself. He therefore invests it in a bank, and draws upon the bank according to his requirements. In this way the bank is enabled to employ a great part of his salary in productive undertakings.

Another use of credit is that it saves the labour and risk of counting and conveying gold and silver coins. Cheques, bank-notes and bills

of exchange serve in Europe the same purpose as coins, and transactions involving payments of vast sums of money are carried on without any transference of specie. A bank-note is accepted as money because people believe in the stability of the bank and that it will pay the money when demanded.

So great, indeed, has been the influence of credit in increasing the wealth of European countries that Daniel Webster remarked that credit has done in Europe "more, a thousand times, to enrich nations than all the mines of all the world." It may be said that without credit the acquisition of wealth will always be extremely slow; only the money that is in the hands of persons who have the time and capacity to engage in industries can be productively employed, while the money possessed by others will either be spent or hoarded. But even though the capital in the country may be small, credit can perform wonders by bringing together all the small savings, and employing a great part of them in the production of wealth.

The essential difference in the modes of credit obtaining in Europe and in India is that in the

former case credit is organised, loans being given by joint stock companies which also collect small savings, while in the latter there is no such organisation, and loans are given by individuals whose only object is to get as much increment as possible on their money, and who are obliged to demand a high rate of interest as insurance against loss. In Europe there are banks to deal with almost every class of men. These institutions are on a vast scale, and serve to generate a spirit of mutual self-help and co-operation which is of extreme importance politically as well as commercially.

In England landed proprietors are assisted with loans by Land Mortgage Banks, which advance money on land or other property for long terms In Germany the number of such Banks is more than sixty. In France there is for the assitance of landowners the famous "Credit Foncier," with more than seventy branches all over the country. In the little state of Switzerland so great is the spirit of self-help and co-operation among the people that there are more than 900 banks of all kinds, including as many as 40 Land Mortgage Banks.

Everywhere in Europe, also, the improvidence of the poorer classes is restraied by the existence among them of popular banks, loan societies, and other co-operative institutions. Unlike the Land Banks which advance money on mortgages, these loan unions and Co-operative Credit Societies demand only personal credit, so that an honest man may have the benefit of a loan however poor he may be. In Germany the peasant proprietors are assisted with loans by Popular Banks and Raiffeisen institutions, and this circumstance has tended vastly to improve their condition. The total number of banks in Germany of the Raiffeisen type is more than four thousand. In France also rural Co-operative Credit Societies are being established and conducted by local agricultural associations, of which there are more than 1,000, and which form the link of connection between the agriculturists and the Central Bank or the 'Bank of France.' Similar institutions are found in Austria, Italy, Belgium and other European countries.

Besides the upper and lower classes of persons connected with agriculture, the industrial

sections of the people also are provided with credit institutions to promote thrift and self-help among them. To meet their requirements there are in every country in Europe a large number of State or Joint Stock banks, which are ever ready to lend money on proper security. This facility of obtaining capital has led to the establishment of an enormous number of special industries and has been the means of giving employment to millions of men.

The growth of credit is a sure sign of the growth of wealth and civilisation. Among savages there is no credit.

> "The good old rule
> Sufficeth them, the simple plan,
> That they should take who have the power,
> And they should keep who can."

In such a state of society it is impossible to expect that one person will lend money to another in the hope of obtaining an increment. Much the same state of things prevails where the government is unsettled and the country is infested with hordes of marauders. The first step in the formation of a system of credit is that of loans given by individuals. This system prevailed in Europe in the Middle

Ages, when Jewish money lenders could be found in almost every town of Europe. This is also the system which prevails in India at the present day.

In India credit institutions of the European type are only beginning to be established, and it is of the utmost importance that their number and importance should be vastly increased. In general there is no reason to fear that a prudently managed bank will fail. The value of a bank consists principally in assisting with money a person who has the capacity but not the means of engaging in an industry. Loans for marriage and funeral expenses are of a different nature and should be given very sparingly. But loans for agricultural improvements and industrial undertakings tend to increase the wealth of the country, and it is these for which banks are specially required. Our countrymen have invested large sums in the Anglo-Indian Banks. They have also invested about two crores of rupees in the Savings Banks and considerable sums in Mutual Benefit Societies. Thus they are not altogether devoid of capital.

It is, therefore, desirable that each class should have an organised system of credit. Let the Zemindars and Landholders from associations among themselves and try to bring about agricultural improvements by establishing credit institutions of the type of European Land Banks, by submitting periodical reports to the Government about their doings and needs, and by lending money on good security solely for purposes of agricultural improvement.

We have already dwelt at length on the necessity of establishing Co-operative Credit Societies and Corn-banks for the benefit of the lower agricultural classes. In order that these institutions may flourish, it is necessary that all misconceptions about them should be removed, and the dreaded *lalpugree* should never appear in their transcation.

The development of each of these institutions implies a spirit of mutual confidence and co-operation. Hence everything that tends to foster these, such as general education, should be encouraged. It is said that the socio-religious institutions of the Hindus, such as the institution of caste, tend to restrict their

sympathies to their own caste, and the feeling that one's interests are bound up with those of society at large is absent among them. A Calcutta Banker, in a recently published pamphlet, traces the practical absence of co-operative credit in India to the social and racial peculiarities of the people. The productive employment of money, in his opinion, represents an advanced stage of national sentiment where the individual feels that his interests are bound up with those of the community at large, and that whatever advances the latter tends also to advance the former. "The offspring of insensate religious bigotry," he writes, "is less evident in money than in social matters, but even the cosmopolitanism of commerce has not yet eliminated the sectional spirit which has hitherto retarded among them the growth of the banking system which has done so much to increase the wealth of western nations." To us, however, it seems that this "religious bigotry" and this "sectional spirit," however great may be their effect in preventing the utilisation of capital, are the result only of popular ignorance, and there is nothing

in Hinduism to countenance them. This "religious bigotry" and this "sectional spirit" were very powerful in mediæval Europe, perhaps more so than they are in India at the present day. The best way of dealing with them is to spread education among the masses.

As individuals working for themselves, their caste or their relatives, the natives of India are thrifty and possessed of a good deal of the wealth-making capacity. This is seen in their investments in the Saving Banks as well as in petty trades and small industries. But they have hitherto been very lacking in the capacity for united action. In the matter of banking the problem of the day is to combine the money-lenders of different classes into associations transacting their business in a public and open manner. Without such united action, Indian merchants and manufacturers will be placed at a tremendous disadvantage in competition with foreigners who, by virtue of the union of several units, have enormous capital at their banks, and thus the whole country will suffer on account of the absence of industries. Thus the

prosperity of the individuals depends in a great measure upon the prosperity of the nation, and this fact must be made clear to all our countrymen.

SOME REMINISCENCES OF INDIA'S COMMERCIAL DAYS.

At this critical period when the thought of every Indian is concentrated on the existing deplorable economic conditions, when the people are striving hard to work out their material salvation in harmony with the new industrial ideals, which the materialism of the age, assisted by science and the enterprise of capital, has brought to the front throught the civilized world of manufactures and commerce, we do not think it is useless to go back to the good old days of India's foreign trade. For, if it be true that the illumined pages in the past history of a country serve as a powerful stimulus to the rising hopes and future prospects of the nation, then we think the object of our present article would be gained. As a matter of historical truth which every school boy knows, suffice it to say, in the words of Sir

William Hunter, that "the industrial genius of her inhabitants, even more than her natural wealth and her extensive sea-board, distinguished her from other Asiatic lands." In no industry was that genius more known from times the most ancient, almost coeval with the first faint glimmer of history, than that of cotton-weaving. You may read of it in the *Mahabharata* and in the descriptions of the earliest Greek and Roman travellers, who emerged from Hellas and Rome, crossed the Ægean Sea and penetrated coastwise, from the delta of the Indus to the farthermost confines of Western India.

The Greek name for the productions of the indigenous weaver was *Sindon*, which philologists associate with Sindhu or Sindh. The very earliest Greek authority on Indian trade, no other than the author of Periplus, describes the variety of rich cotton fabrics exported by this country. Let alone ancient history and, for the matter of that, the mediæval. It will be sufficient for the purpose of this essay were the reader's attention called to the condition of the foreign trade at the

commencement of the 17th century, when the Great Moghul was firmly seated in the Imperial City of Delhi and ruled the vast peninsula, while ambassadors from the countries of the West sued for grace to have a foot-hold of land at Surat, at Calicut, at Masulipatam and other eastern sea-ports, for exchanging European products for India's finest calicoes and muslins, its spices and saltpetre, its sugar and silk.

It is superfluous to observe that prior to the discovery of the passage round the Cape of Good Hope, Indian manufactures were conveyed by sea to the Persian Gulf, the oldest highway, thence to Bassora and Aleppo. Aden, again, was another entrance leading to Egypt and Syria. The merchant princes of Venice were the most important intermediates in the distribution of Indian commodities in Europe. England herself for a long time was supplied with Indian goods shipped in Venetian vessels. The Portuguese followed the Venetians. In the sixteenth century England was known to have entered into a commercial treaty with the Sublime Porte. The Levantine merchants in 1576 were known

to be the true East India traders. They had factories at Alexandria, Aleppo, Damascus and at some of the Egyptian ports. The cupidity, of the English was keenly excited. And as early as 1583, three English merchants were known to have travelled overland to India provided with letters of introduction to the King of Cambay. They proceeded to Bagdad, *via* Tripoli, and down the Tigris to the Persian Gulf; from here they sailed for Goa. Of the three merchants, one went to Agra and entered the service of the Great Moghul, another died, while the third travelled further east up to Malucca.

Some unfruitful years rolled on during which spasmodic efforts were made by England to wrest some of the profitable Indian trade from the Portuguese and the Dutch. Pepper, which was sold at a fabulous price in those days, was greatly prized, and so great was the avarice of the Dutch from whom the English bought that article, that some of the English traders grew exceedingly incensed. The rate at first was three shillings per pound, but it is needless to state that the

purchasing power of those three shillings was considerably greater than now. The Dutch at once raised it by a bound to six and eight shillings per pound. So exorbitant a price made the English traders in the commodity exceedingly angry. So, on 22nd September 1599, the Lord Mayor and Alderman called the city merchants together, numbering a hundred, and formed a trading society for the establishment of commercial relations with this country. About £30,000 was raised, which was the first practical beginning of British trade with India.

No doubt, at the close of the 16th century, the spices of India and Borneo, valuable as they were, attracted the attention of the British. But the fact shows how valuable must have been the Indian trade to the commercial men of Europe that they vied with each other to secure the highest profits. Of course, the Great Moghul had no customs establishment to speak of at the great sea-ports. There was none of the modern Imperial Maritime Customs and no Reporter-General of external commerce to record the statistics of the sea-borne

trade. If now and again we get glimpses only of that trade and its profitable character, it is almost entirely owing to the accounts which the enterprising European commercial agents or travellers give.

The very first charter of which we have knowledge was the one granted by Queen Elizabath, on 31st December 1600, to some of the merchants desirous of trading with the East Indies. It was this charter which constituted "The Governor and Company of Merchants of London trading with the East Indies." It was a corporate body with a common seal. It may be interesting to reproduce here the extensive purpose for which the Company was formed, according to this pioneer charter. "Freely to traffic and use the trade of merchandise by sea and in such ways and passages already discovered, or hereafter to be found out or discovered, as they should esteem and take to be fittest, into and from the East Indies, into the countries and Ports of Asia and Africa ; and into and from all the islands, ports, harbours, cities, creek, rivers, and places of Asia, Africa, and America or any of them beyond the Cape of

Good Hope to the Straits of Magellan, where any trade or traffic may be used to and from every one of them, in such order, manner, from liberty and condition as they themselves should from time to time agree upon." Here then is this all-embracing society, the germ of what hereafter was to be the potential and sovereign East India Company. Even at the very threshold of its enterprise its vision of trade comprised the entire civilised world! In its ken it actually embraced all countries from China to Peru!

We need not pursue further the fortunes of this Company, which for the 15 years of its charter ploughed the deep seas in search of India's cotton fabrics and spices. It may be noted that such was the increasing value of the trade and the magnificent profits to be derived from it, that it is recorded in one of the agreements which in 1614 was attempted to be made between the English Company and the rival Dutch, who had enjoyed the golden fruit of their prior enterprise and adventure, that on a capital of $1\frac{1}{4}$ million sterling the yearly return in spices alone was estimated at £600,000. These spices

were chiefly the products of the Malabar Coast and the Maluccas. In 1615, the same year that Sir Thomas Roe sailed to present his credentials from King James I to the reigning Emperor at Delhi and prayed for a *firman* containing the most favoured nation clause for the English traders, there was published a pamphlet in London called "Trade's Increase," in which the opponents of the pioneer Company laid the allegation that it was depleting or draining the country of the silver bullion ! This is a most noteworthy fact. It seems that there was a time when bullion was not only prized in England but deemed so rare that its drain to the East formed the subject of a national complaint. But to-day the drain is the opposite way, and that by many times over, not in spices alone, but in other products. Thus have times changed and the trade too.

But to return to the subject. We may give a description of the commodities themselves as imported into Europe in 1614, according to the statistics published by Mr. Munn, a wealthy London merchant and a Director of the East India Company.

INDIAN GOODS CONSUMED IN ENGLAND IN 1614

		Cost on board in India.	Selling price in England.
25,000	lbs Pepper ...	£26,042	£208,333
150,000	„ Cloves ...	£ 5,626	£ 45,000
150,000	„ Nutmegs ...	£ 2,500	£ 18,750
50,600	„ Mace ...	£ 1,666	£ 15,000
200,000	„ Indigo ...	£11,667	£ 50,000
107,140	„ Silk ...	£37,499	£107,140
50,000	Pieces of Calico	£17,500	£ 50,000

The reader may judge of the profits, after deducting freight and other charges yielded by the several articles. Let it be noted that 50,000 pieces of calico or cotton fabrics costing £17,500 actually yielded £50,000 or almost three times as much ! No wonder England's avarice was greatly whetted for reaping the rich harvest of India's sea-borne trade. But it also shows how profitable the trade was to the Indian merchants themselves. We need not enter here into the triangular political quarrels of the Portuguese, the Dutch and the English in India. For that the reader should refer to the history of the times. This episode in the early history of trade between England and India should be carefully

noted by the economic student. It is impossible to ignore the great economic value of the early trade of the British with India. The reader will notice how from small beginnings were laid the foundations of a commerce which has gone on uninterruptedly till every nationality outside Asia competes for a share of this country's trade at the commencement of the 20th century. Even in the middle of the 17th century, England was greatly indebted to India for the employment she found for many of England's toilers and for the wealth she gave which enriched the English people. The trade became so profitable that British traders began building extensive yards in Blackwall, and constructing their own ships, varying from 700 to 1,200 tons or more. They made their own masts, yards, sails, anchors, cable and cordage. And in order to defend their ships against pirates on the high seas they even obtained a licence from the King to import saltpetre and manufacture their own gunpowder. Were not all these occupations a great stimulus to the unemployed ? Did not they establish many industries which to-day have grown into separate collosal trades. And did

not those who pursued these industries rise to affluence and power? These were the economic benefits which the Indian trade conferred on the British over two hundred and fifty years ago.

Freight, of course, was very dear. It cost the traders from £25 to £30 per ton! Contrast this rate with the 5 to 10 shillings of to-day. And yet, as a matter of fact, the margin of profits was golden compared with the bare 4 to 10 per cent. of the present day. It must, however, be observed that the perils of navigation were in an inverse ratio. They are next to nothing to-day. But in those days piracy was considered a most profitable, if not an honourable pursuit, while trade in reality was a perilous adventure. But the good old adage had to be borne in mind that if you ventured nothing you got nothing.

And eventually it was the case of the swiftest and the strongest. From Madagascar to Macao there was a constant struggle for commercial supremacy, a persistent effort to "squat" at some profitable post or vantage ground whence to sweep away the fat of the land.

Hence diverse had been the petitions to King and Parliament and diverse the orders of council and trading charters. But the increase of imports was viewed with apprehension in England.

Those who thought that the large importations of silks from India were injuring their trade began to murmur, till their murmurs rose to tumultuous proportions. The guild of the silk mercers complained that Indian silks and calicoes were worn by all sorts of persons in greater quantities, which curtailed the sale of the indigenous stuffs. They were so enraged at the East India merchantmen that they attempted to take the law into their own hands by seizing a consignment of treasure in the docks. But let us pass over these early ebullitions of trade jealousy, which in reality were the premonitory indications of heavy and crushing protective tariffs later on, which inch by inch killed the profitable Indian trade in those articles which the home weavers produced.

It will be interesting to compare the volume of exports from England and the imports from

India during the period 1708 to 1733 and 1734 to 1765.

Exports from England.

	Merchandise.	Bullion.	Total.
	£	£	£
1708 to 1733	3,064,744	12,189,147	15,253,891
1734 to 1765	8,434,769	16,081,496	24,516,265

Imports from India. £

1708 to 1733 35,571,709

1734 to 1765 64,452,377

The net result of a century of commerce showed that there was a balance of trade in favour of India and against England to the extent of 286 millions. But the commencement of the 19th century turned the tables upon India and brought fortune to Great Britain. Steam and applied science had begun to have their beneficient effect on the textile industries. All things portended the coming event of the decline of Indian manufactures and therefore of its profitable export trade. May we hail your revival! India's once bright commercial days!

OUR TOBACCO TRADE

In recent years there has been some increase in the tobacco trade of India. The fact of it is that the soil and climate of India are well-adapted to the cultivation of tobacco. Tobacco is the name given to plants belonging to the genus *Necotiana*, which is really a native of the West Indies and of Virginia. It was the Spaniards who became first acquainted with tobacco, and it was introduced into England by Sir Walter Releigh. "My master is on fire," ejaculated the servant and rapidly ran to pour a bucketful of water on the head of Sir Walter Releigh, as the latter was leisurely throwing off puffs of smoke. The Dutch merchants are supposed to have brought tobacco into India about the year 1617. In the present time several thousand acres of land are under tobacco cultivation, and each year the tobacco so cropped increases. Tobacco is cultivated on a large scale in the Salem and

Trichinopoly districts of the Madras Presidency, also in Bengal, the Deccan, &c. Of the many conditions affecting the quality of tobacco, the most important is climate. The aromatic principles on the presence of which the value of tobacco chiefly depends,can only be properly developed in the plant by the agency of high temperature and moisture. Where the climate is favourable, a fine and valuable tobacco may be grown with less expenditure on labour, &c., than it is necessary to bestow in raising an inferior article in less suitable climes. The soil affects to a great extent the quality of tobacco. The plant thrives best in a soil rich in vegetable mould; this, however, is not so much required to supply the plant food, as to keep the soil in good physical condition. A light soil, sand or sandy loam, containing an average amount of organic matter, and well drained, is considered best adapted for raising smoking-tobacco, and such a soil produces the finest leaves.

Of less importance than the physical properties of the soils is its chemical composition. By proper tillage and heavy manuring, tobacco is sometimes grown on comparatively poor soils. From

analysis of the plant, it is clear that it contains a large amount of ash constitutents, which it extracts from the soil; the most important of these are potash and lime. A soil destitute of these constitutents would require a great quantity of manure for the better production of tobacco.

In India, tobacco is chiefly grown from seed sown between the end of August and middle of January. The plant is one of four months' cultivation, so that plants from seeds sown late in December are ready for harvest in April. The seeds are sown in carefully prepared beds, the soil of which has been freshly dug, turned up and manured with equal parts of wood-ashes and dung-heap rubbish. The ground to which the seedlings are to be transplanted is well ploughed and manured, narrow deep trenches are dug about a foot wide with ridges between them, on the top of which the seedlings are planted. They are ready for this removal, when they have thrown out three or four leaves ; the deep trenches are filled with water, and the seedlings carefully inserted in the ridges between them, at distances from 16 to 18 inches apart. For

the first few days they are daily watered, and after that every second day during the whole period of growth. About three weeks after the plants have been transplanted they are thoroughly weeded by scraping between the plants with cocoanut shells. In another fortnight the weeds are again destroyed, this time by hoeing, and then any gaps caused by plants dying are filled up with fresh plants from the young stock kept in reserve in the seed-beds for this purpose.

At the end of three months a third weeding takes place, and the side shoots are broken off. When the leaves attain a certain size the lowest are picked off, as this increases the size and vigour of those above. From eight to ten good-sized leaves are left on the plants; and a certain number are allowed to grow to their full size for the sake of seed. The amount of seed required for an acre chiefly depends on its vitality. One ounce contains about 100,000 seeds, sufficient for nearly 7 acres if all grew. The plants commence to ripen about three months after being planted ; this is indicated by the leaves assuming a marbled appearance

and a yellowish-green colour. They have also a little brittle feel to the touch, and break between the fingers if roughly handled.

The plants are then cut down, but not until the dew is off the ground. Moisture at this period would ruin the crops. The plants are then taken to the drying-shed, where they are piled on a heap of straw, and are covered over with palm-leaves and pressed with heavy stones for five or six days. Then the pressure is removed and the stems are hung up to dry. When the leaves, after being once properly dried, have again become pliable, stripping from the stems is resorted to. Under no condition should the tobacco be stripped when not pliant, that is when the leaves are so brittle as to break in bending or rolling.

As regards flavour the leaves have to be cured. There is no doubt that by proper application of ingredients, the value of tobacco may be greatly enhanced. The most costly tobacco often commands a high price, not so much on account of its inherent flavour, as from that given to it artificially, and this is a fact the Indian manufacturer would do well to note. An

inferior tobacco, which often would not find a market, is sometimes so much improved by artificial means, as to compete successfully with the genuine fine article. It is said that in Germany indigenous tobacco is often so much improved that the cigars made from it, after being covered with a fine tobacco leaf, are sold as genuine Havanahs.

Our manufacturers should try to "improve" the tobacco leaves, like the foreigners, and this done, the Indian cigar will successfully compete with the Havanah or Manilla cigars. The value of a cigar depends, not only on the intrinsic value of the leaf, but to a great extent on the mode of manufacture.

Thus the raw material may be of good quality, but if the maker does not classify the leaves properly, or if he rolls his cigar too hard, which must vary according to the qualities of the leaves, the cigar will turn badly. The best burning leaves must always be used for wrappers. When this is neglected, the inside of the cigar burns faster than the covering, the air has no access to the burning parts and the empyreumatical substances are volatilised without being

decomposed. Such cigars, therefore, make much smoke and smell badly.

Cigars and cheroots are made at Trichinopoly, Manilla seeds have been tried on the Lower Palni Hills, but the Wynaad has proved to be the best locality.

The total areas under tobacco were thus returned.—Bengal, about 300,000 acres; Punjab, over 90,000; Oudh, about 69,500; Central Provinces, 55,000; Mysore, 30,000. In Bengal there were about 60,000 acres under tobacco cultivation in Rungpore (affording the so-called "Burma cheroots"), about 10,000 acres in Dinajpur, in Tirhoot 40,000, in Cooch Behar 24,000.

The exports in value for four years, *i.e.*, up to 1904, stand thus :—

ARTICLES.	1900-01.	1901-02.	1902-03.	1903-04.
Tobacco.	Rs.	Rs.	Rs.	Rs.
Unmanufactured ...	6,48,102	17,86,133	14,70,712	12,86,241
Manufactured cigars...	8,64,254	16,40,427	12,27,690	7,72,799
Other sorts ...	36,745	42,440	34,857	37,639
Total ...	15,49,101	34,68,999	27,33,259	20,96,679

The imports for the corresponding years are as follows :—

ARTICLES.	1900-01.	1901-02.	1902-03.	1903-04.
Tobacco.	Rs.	Rs.	Rs.	Rs.
Unmanufactured ...	3,07,995	6,44,383	3,36,434	3,08,131
Manufacturedcigars	2,34,209	2,97,011	2,87,411	3,41,818
Cigarettes ...	17,03,968	20,94,476	23,64,448	29,54,331
Others sorts ...	15,58,588	14,68,489	14,76,918	13,64,796

Thus we see that the imports of tobacco into India have considerably augmented of late years. Even as regards the raw material, India might do a great deal more than at present, for there would be a large and constant demand in Europe for the Indian leaf, if it could be obtained of a somewhat better quality. France and Italy are prepared to take Indian tobacco in large quantities ; and if it could be supplied of a quality suited to their purposes, there would also be an extensive demand from Austria and Germany. It is, however, satisfactory to note that tobacco manufacture in this country is on a way to progress and bids fair at no long distance of time to create for itself a steady and large market in

foreign countries. In the enterprise carried on at Ghazipore in the United Provinces and Pusa in Behar, both the cultivation and manufacture are under the supervision of skilled American growers and curers. The factory at Ghazipore turns out a large quantity of tobacco every year of all classes, and the machinery is capable of turning out 3,500 lb. a day.

Hitherto no Indian tobacco has realised any valuation approaching to that of the American. But there is no reason to despair. It cannot be denied that the Indian leaf is as good as the American leaf for all practical purposes, and there is hardly any doubt that America cannot afford to sell home leaf at the price at which India can sell. The one great advantage which India has over America is cheap labour. The chief point worth noticing is that a sufficiently high level should be attained in the curing of the leaf.

The tobacco leaves are received by the manufacturer in all kinds of packages and of all weights. The first process they undergo is "damping," which is necessary to overcome their brittleness, and admit of their manipulation without break-

ing. For this purpose the bunches are separated, and the leaves are scattered loosely on the floor, recessed to retain the moisture. A quantity of water, which has been accurately proportioned to the absorbing qualities of the leaf used, and to the weight present, is applied through a fine-rosed watering pot, and the mass is usually left for about 24 hours; it being damped one morning becomes ready for working on the following morning.

Quantities of leaf-tobacco are stripped in a condition deprived of their stem and midrib and are then known as "stripts." Those which are not received in this state, after having been damped, are passed through the hands of workmen, who fold each leaf edge to edge, and rip out the midrib by a deft twirl of the fingers, classifying the two halves of each leaf, and ranging the sorts in separate piles as smoothly as possible. The value of the leaf greatly depends upon the dexterity with which the stripping is done, as the slightest tear deteriorates it. The largest and strongest leaves are required for cutting and spinning; the best shaped are reserved for wrappers of cigars; and

the ribs, after being thoroughly dried, are ground to make snuff.

Cutting is the process by which the damped leaves, whether stripped or not, are most extensively prepared for smoking in pipes and making cigarettes. For this purpose a tobacco-cutter is used.

Cigars are composed of two parts, a core formed of pieces of leaf placed longitudinally, known as "fillers," and a covering formed of perfect leaf called the "wrapper." Probably all the best cigars are made by hand, the only tools required being a short-bladed sharp knife, a receptacle containing an emulsion of gum and a square wooden disc or "cutting-board." A portion of perfect leaf is first shaped to form the wrapper of the cigar; then a bunch of fillers is moulded in the hand, and rolled up tightly in the wrapper, the taper end being secured by gumming. Expert workmen make the cigars remarkably uniform in weight and shape. When made, they are sorted according to colour, trimmed at the thick end, and placed in their boxes in cupboards heated by gas-stoves to finally dry or season before being stored for

sale. In America, machinery is introduced wherever possible. Moulds for shaping the cigars are made of hard wood, sometimes partially lined with tin, and of every possible size and form.

Cigarettes consist of paper tubes filled with cut tobacco. Of cigarette-making machines there are many kinds; the best are those which deal with the tobacco in a comparatively dry state, thus preventing shrinkage after packing. We understand that in America thousands of tons of dried beetroot leaves are passed off as tobacco. These as well as cabbage leaves are steeped in tobacco-water for a long time. Afterwards they are dried and cut ; the next operation being to mould them into cigars and cigarettes. Of the latter article India has become a large customer ; the value of the import of cigarettes for the last year amounted to Rs. 29,54,331. It is much to be regretted that our capitalists and business men should not even now awake to the possibilities of establishing big cigarette establishments in India. While retaining the wealth of the country, such establishments would solve the bread problem of thousands of the wretches

at whose face grim starvation stares, and none the less would prevent the influx of foreign cigarettes, generally made of cabbage and beet-root leaves.

Needless it were to comment on the effects of smoking these adulterated cigarettes, which have been pronounced by the highest medical authorities as extremely injurious to health. We want a true patriot, one who actually feels for the needy to work in the practical field. If there are such patriots, let them come forward, and with the co-operation of their brains and capital do what they can to give employment to the poverty-stricken masses of this country, as far as possible. As for the subject we are now writing, we will not attempt to say more, excepting a few remarks on the cost of cultivation, manufacture, &c., &c. An acre of tobacco produces about 800 lb. on the average; cost of cultivation and curing can, including export, be kept probably to 2 annas, and if manufacture is added, to 3 annas.

The price of cured leaf ought to be, if it is to compete with American tobacco, 5*d.* a pound,

and of manufactured tobacco in India about 10 annas. The minimum net profits of 100 acres at these rates are 800 × 2 annas × 100 = Rs. 10,000 for cured tobacco, and 800 × 6 × 100 = Rs. 30,000 for manufactured tobacco.

The above figures show that there is a good margin for profit in tobacco; the market in which it competes is of large extent; and it is almost proved that tobacco cured in India can be sold in Europe at a profit for a price at which it would not pay America to send it.

The great thing lacking in Indian tobacco, both cured and manufactured, appears to be its want of proper seasoning; it is in the market too soon after it is cured, cigars as well as tobacco are not kept long enough to mature properly. Before long, Indian tobacco, it is hoped, will be placed in competition with American, especially if the improvements which have of late taken place in its growth and manufacture are continued.

THE INDUSTRIAL VIEW OF INDIA

There can possibly be no two opinions as regards the early civilization of India. Though we may disbelieve in the conquest of any part of India by the Egyptians or the Assyrians, yet the very prevalence of such traditions in the earliest times of which we have any record seems to prove that the country was famed for the richness of its products and for the early civilization of its inhabitants.

We know, moreover, that Alexander the Great found them civilized more than 2,000 years ago, and the Chinese derived their most popular religion and one class of their sacred books from India. The sword blades of Herat, Mushed and Shiraj were highly esteemed, but were all made with steel imported from India.

Egypt, we have the most undoubted proofs, was also in a highly civilized state, and many

of the arts which the Egyptians had carried to a high degree of perfection even 2,000 years ago were strikingly similar to those practised in India at the time.

The hymns of the Vedas are considered to have been composed at least 1,200 or 1,300 years B. C. In the Rig Veda, which has been translated by Professor Wilson, it is said that the Hindus were a manufacturing people ; for the art of weaving, the labours of the carpenter, and the fabrication of golden and of iron mail, are alluded to ; and, what is more remarkable, they were a maritime and mercantile people.

The arts and sciences, as known to the Hindus, were reckoned, according to Abul Fazl, to be about three hundred in number. The *Silpa Sastra*, however, which a Sanskrit collection of treatises on arts and manufactures, enumerates only sixty-four ; but as these are the leading arts, they each embrace a number of subordinate divisions.

It is the village system of the Hindus to which we ascribe the permanence of the arts in India ; for though very often the storm of conquest

swept over the plains of India, still we see the arts continuing to flourish in the very places where they had attained their excellence, although the scientific manufactures of Europe have crushed many of the arts. The arts which are strictly chemical may be supposed to have originated only in a country where the science of chemistry had made some advance. We know from a variety of sources that the Hindus have long been acquainted with many chemical substances, and have practised many chemical arts.

The ordinary metals, including tin, have long been known to us and we have prepared the oxides of iron, lead, tin and zinc.

The ashes of plants in a country of wood-fires, led our ancestors to the discovery of potash. Alum was obtained by throwing potash on alum slate. Among the salts of the metals we find the sulphates of copper, of zinc, and of iron, the acetates of copper and iron, and the carbonates of lead and iron. We have been long acquainted with three mineral acids, while lemons and limes gave us citric acid and the gram plant the oxalic acid. It is evident, there-

fore, that the Hindus possessed many chemical substances, and they prepared others; hence we might infer that they practised some of the chemical arts, so useful in the economy of industrial and commercial life.

In the present state of the chemical arts advanced as they have been by the cultivation of science in Europe, nobody knows that there are some products obtained by the natives by their original and primitive processes, and there is no reason why India should not prepare some that might become articles of commerce; such, for instance, as benzoin and citric acids, the salts of morphia, &c., &c.

The sulphate of magnesia is interesting as prepared from magnesite, or the natural carbonate of magnesia found in India.

Metallurgy was known to the Hindus from the very earliest times of which we have any record. The art of smelting iron and of forging steel was practised by the Hindus to a high degree of perfection, and in Persia the Indian steel is known by the name of *fouladi-hind*. The best Persian swords have been made with the Indian steel, which long

formed an article of trade from Bombay to the Persian Gulf. There is no doubt that the ancient Indian temples and fortresses were carved with steel instruments. That the Indian steel was highly valued in the time of Alexander the Great, is evident from Porus's making him a present of about thirty pounds of steel ; and still earlier, in the Rig Veda, we read of chariots armed with iron weapons, of coats of mail, arms and tools of different kinds, and of bright-edged hatchets. The *Silpa Sastra* describes the ore used as the magnetic oxide of iron, consisting of seventy- two per cent. of iron with twenty-eight of oxygen, combined with quartz, in the proportion of fifty-two of oxide to forty-eight of quartz. It is prepared by stamping and then separating the quartz by washing. The furnace is built of clay alone, from three to five feet high, and pear-shaped ; the bellows are formed of two goat-skins, with a bamboo nozzle, ending in a clay pipe. The fuel is charcoal, upon which the ore is laid without flux; the bellows are plied for four hours, when the ore will be found to be reduced; it is taken out and while yet red-hot, it is cut

through with a hatchet, and sent to the blacksmiths, who forge it into bars and convert it into steel. In an old account it is said that one pound and a half of iron is heated lower than red heat, and then beaten for about three minutes with a stone hammer on a stone anvil, experience having taught them, they say, that instruments of iron ruin the process. The iron is forged by repeated hammering, until it forms an apparently uncompromising bar of iron, from which steel of the very best quality is obtained. By such methods the Hindus prepared steel, which long formed an article of commerce from the West of India to the Persian Gulf.

The other metal which it seems necessary to mention is tin, because it is connected with so many metallurgical compounds. As the nations of antiquity employed tin for hardening copper, and used the alloy for forming swords and spear-heads, so the Indians formed various compounds with copper and tin, which are remarkable for their hardness, and for the fine sounds which they emit on being struck. An alloy of ten grains of copper to two

and a half grain of tin was the best mixture made in this country.

British spear-heads are found to consist of one tin to seven and a half of copper. The Indians are acquainted with a variety of alloys for making utensils, as with copper, tin and lead.

The manufacture of glass is one of those discoveries which could hardly escape being made by such people as employed furnaces to reduce metallic oxides; for the necessary ingredients must often have been present and the heat was sufficient. The people of this country seem to have been long acquainted with making different ornaments of glass, such as anklets and armlets. Small glass bottles have also been made in India, but not with much success. It is probable that the extensive diffusion of the oxide of iron in Indian soil, which may have led to the discovery of iron, prevented the manufacture of good glass. One of the simplest processes for making glass is that practised in Behar.

The saline efflorescence of the soil, which is an impure carbonate of soda, is collected and thrown into a cistern lined with clay. This is

then filled with water, which is afterwards allowed to evaporate. When dry, the bottom of the cistern is found covered with a thick saline crust, the clay which was intermixed having subsided before the salt began to crystallise. This soda makes glass without any addition, as it still contains a sufficient portion of siliceous matter. Anyhow, the manufacture of glass has made but little advance in India.

Enamelling, or the art of fixing colours by melting in fire, is of very ancient date ; it was practised by the Egyptians and carried to a high degree of perfection in Persia. The art is known in every part of India and is chiefly employed in ornamenting arms and jewellery, not only in gold, but also in silver. The Indian artisan is stated to make two enamels ; one is yellow ; five parts of lead are melted in a shallow crucible, and to these is added one part of tin ; and the alloy is calcined for four or five hours. It is then heated to redness in the crucible or the glass-furnace. One part of white quartz is next added, and the mass stirred about for three hours. It is then poured out on a smooth stone or iron, and cooled in water. One

part of the palest green glass is added to make the yellow enamel. The green enamel is also made in the same manner by adding a small portion of the black oxide of copper.

Pottery.—The art of fashioning clay into vessels of a variety of shapes, and hardening it by the action of heat, is one of the most ancient of the arts prevalent in India. Fragments of pottery are everywhere found among the ancient cities of India, as in those of other parts of the world; pottery, as Brogniart has remarked, affording the best record of the early ages of man, as bones do of the earth.

The potter's wheel is the instrument with which the Indian artisan works; and while it revolves, with the aid of his naked hands he fashions vessels of elegant forms, many of which have been admired as being of classical shapes. This beauty of form and design is equally conspicuous in the pottery of Sewan or Patna, Ahmedabad or Azimgarh, Chunar or Moradabad. Some of it is remarkable, also, for its extreme thinness and lightness, showing the great skill of the artist. The painted pottery of Kotah and the gilt pottery of Amroha are also objects of ad-

miration. The glazed pottery of Martaban and Pegu has long been known for its glaze and for its not being affected by acids. The white goblets of Arcot and the light-coloured pottery of Madras are also admirable.

In connection with pottery might be mentioned the variously coloured *tiles* which have been used for the domes of some of the tombs near Delhi and Agra, as well as in Southern India, but we cannot say whether the art is at present practised. It was probably introduced by the Mahomedans from Persia.

The art of *bleaching* is practised in all parts of India, and some places which are the seats of cotton manufacture are famous for bleaching, such as Dacca. Fine muslins are merely steeped in water, other cloths are first washed ; but all, of whatever texture they may be, are next immersed for some hours in an alkaline solution, composed of soap and *saji mati*, that is impure carbonate of soda. They are then spread over the grass and occasionally sprinkled with water, and when half dried are removed to the boiling-house in order to be steamed. For 10 or 12 days the steaming is done, and then they are steeped

in clear filtered water acidulated with lime-juice, in the proportion generally of one large lime to each piece of cloth. Lime-juice has long been used in bleaching, in all parts of India, and Tavernier describes Baroche as a famous bleaching station, on account of its extensive meadows and the large quantity of lemons produced there.

Mixed fabrics of cotton and muga silk are steeped in water mixed with lime-juice and coarse sugar, which latter article is said to have the effect of brightening the natural colour of the silk.

The art of *dyeing* is no doubt of very ancient date, and one with which the Indians have long been acquainted. India produces plenty of raw materials for producing a great variety of colours; some of these are of so conspicuous a nature, such as the flowers of some plants, that the desire must early have occurred to transfer these colours to the cloths of so early a civilized people as the Hindus. This could have been easily done with the fugitive colours, but as they know how to make a colour like that of indigo, which undergoes a considerable degree of

chemical change during its formation as well as while applied to the dyeing of its blue colour, it is evident, even if we had no other information on the subject, that they must have paid attention to some chemical substances.

That the art of dyeing was early practised, we have the proof in the fact mentioned by Pliny, that flags of various colours were displayed by the Indians. It has been supposed that the Hindus may have learned this art from the Egyptians, but the probability is as great that the latter borrowed it from the former, from whom also they probably obtained the alum which was celebrated by the name of Egyptian alum. It would take too much time and space to enter into the details of these dyeing processes, many of which are now well known, and seem to have been followed in Europe until very recent times.

The art of *calico-printing* is another of those crafts which was common to the Egyptians and the Indians, and is still largely practised by the latter, and with a skill which produced much to be admired even in the midst of the productions of the world. Pliny was acquainted with

the wonderful art by which cloths, though immersed in a heated dyeing liquid of one uniform colour, came out tinged with different colours, and which afterwards could not be discharged by washing. The Indians practised this art before the advent of Europeans to this country.

The cloth-printers at Dacca are employed to stamp the figures on cloth which is to be embroidered. The stamps are formed of small blocks of wood with the figures carved in relief. The art is now practised to such perfection in this country that the Indian patterns still retain their own peculiar beauties, and command a crowd of admirers. This is no doubt due in a great measure to the knowledge which they have of the effects of colours, and the proportion which they preserve between the ground and the pattern, by which a good effect is procured both at a distance and on a near inspection. Printing in gold and silver is a branch of the art which has been carried to a great perfection in India, as well as upon thick calico and fine muslin.

Leather-making is another chemical art with which the Indians have long been acquainted,

and the art is still practised in Native States, where it is not likely to have been introduced by European influence, as for instance in Kashmir and in Cutch, whence we have skins dyed of different colours. The native shields are, however, not to be surpassed.

Soap seems to have been introduced by the Mahomedans, though the Hindus have long used alkaline leys, obtained from the ashes of plants, for many of the purposes of soap; and we have a substitute for soap in several berries. The purely Indian soap is made of shell-lime, common salt, impure carbonate of soda and sesamum oil.

Lacquer-ware.—The word lacquer is derived from the Indian name *lac*, which is the resin secreted together with lac-dye by the lac insect, a species of *coccus*. It is mentioned in many of the Indian works and is used for a variety of purposes in India, and it is the common material for uniting things together as gum and glue and is also used as varnish. Sealing-wax is also made from *lac*.

The art of making paper is considered to be a Chinese invention, but it has long been known

in India, where paper was made both of cotton and of the substitutes for hemp and flax.

Textile Arts.—India has, from the earliest time of which we have any record, been famous for its textile fabrics ; and notwithstanding the great mechanical inventions of Europe, she is still able to produce her " webs of woven air," which a Lancashire manufacturer of the last century attempted to depreciate, by calling them the shadow of a commodity; at the same time his townsmen were doing all they could to imitate the reality, which they have not yet been able to excel.

Though the invention and completion of a loom for weaving would indicate a high degree of ingenuity, the Hindus were acquainted with it at a very early period, for in the hymns of the Rigveda, composed at least 1200 years B. C., " weavers' threads " are alluded to, and so also in the Institutes of *Manu*. That the Hindus were in the habit of spinning threads of different materials appears from another part of the Institutes of *Manu*, where it is directed that the sacrificial thread of a Brahmin must be made of cotton, that of a Kshatriya, of *sana*, and that of a Vaisya, of woollen thread.

The natives of India prepare fabrics not only of cotton, but also of hemp, and of jute, and other substitutes for flax ; also of a variety of silks, and of the wool of the sheep, goat and camel, as well as mixed fabrics of different kinds. But it is for the delicacy of the muslins, especially of those woven at Dacca, that India has so long been famous. It is pleasing to find that these manufactures still continue pre-eminent for fineness combined with softness. From a careful examination of the cottons grown in different parts of India, as well as of those of other parts of the world, it has been found that it is not owing to any excellence in the raw material that the superiority in the manufacture is due, for Indian cotton is not only short but coarse in staple. It is owing, therefore, to the infinite care bestowed by the native spinners and weavers on every part of their work, that the beauty of the fabric is due, aided by the matchless delicacy of touch for which the Indians have long been famous. Though the cotton manufactures of India have so greatly fallen off, from the cheapness of English manufactured goods, it is gratifying as well as unexpected to note that the finest muslins of Dacca

still hold their own and maintain their celebrity in the country, and are considered worthy of being included among the most acceptable gifts that can be offered on some festive occasions.

Fine muslins are turned out not only in Dacca, but also at Santipore, and Krishnagore in Bengal. Among the fabrics there are a great variety, which prove that there is done in this country every kind of weaving, from *guzzees* and *gaazees*, to striped, chequered and flowered muslins. Most of these flowered muslins are uniform in colour, but some are in two colours, and chiefly woven in Bengal.

Flax, hemp, and substitutes for them are all well known and extensively cultivated in every part of India, and flax only on account of its seeds, which yield oil and oil-cake, though some very good flax is being produced in some parts of Bengal. The fibre of the hemp plant as grown in the plains is too dry and brittle to be useful either for rope-making or for textile fabrics, though in the Himalayas some excellent ropes and canvas are made and the culture might greatly be extended if there was a demand for the produce. Species of crotalaria, of chorcorus, and of

many-other genera, yield fibres which are used for rope-making, but that of the species of chorcorus, commonly called jute, for making gunny bags, used for packing, which are even exported to America for packing cotton. The *Rhea* fibre, which is closely allied to, if not identical with, the China grass, is used for making fishing-nets, and some kinds of fabric, but its employment may be greatly extended. So also the plantain, and the pine-apple fibres, of which some fabrics have been attempted, but in too small quantities to attract much attention, though they will one day become important articles of commerce.

Silk.—Silk is a production of China, and said by Chinese authors to have been known there for thousands of years. It has long been imported into India from China. The earliest notice is in the Mahabharat, where *Cheenas*, *Hoonas*, &c., are said to have brought silk and silk-worms as presents to Yudhisthira. When the China silkworm was first introduced into this country as an object of culture we have no information ; but what is called the indigenous (*desee*) silkworm, such as *Tussur*, *Mooga* and *Eri*, is carefully distinguished from the China worm.

The silk of Bengal was originally very inferior in quality, and very carelessly wound. The East India Company in the year 1757 sent a Mr. Wilder to improve the winding of silk, and in the year 1769 other Europeans as drawers, winders, reelers and mechanics.

Murshidabad has long been a central mart for silk goods and good silk fabrics are manufactured at Benares, in Hyderabad, Mysore, and Cutch. The silks manufactured at Poona, Surat and Thanna are also to be admired for their patterns. The silks produced in Kashmir are admirable both from the substantial nature of the fabrics some of which, we believe, are called *Tafeta*, and for the moderated tons of the colours with which they are dyed. The flowered silks or brocades made at Benares and at Ahmedabad elicit praise for their richness and happy disposition of pattern and combination of colours.

Woollens.—As the skin of the sheep was probably one of the earliest materials employed for covering the body, so its wool having the property of felt, must early have led to the discovery of one kind of cloth, while the length of its staple and the facility with which it can

be twisted into thread would lead to the formation of woollen yarn, which, as we have stated above, was early employed by the Hindus as the sacrificial thread of the lower caste. We have merino wool from the table-land of Mysore and indigenous wools from the hilly country of the North-West frontier, some from Lahore and others from the dry and cold climate of Tibet. In Tibet many of the animals are furnished with a fine down and hair-like wool, under the coarse common outer wool. It is this which is chiefly employed for the shawls and the shawl-wool cloth. We think some very substantial woollen cloths and blankets are made in different parts of the country. The fine shawl-wool cloth of Kashmir, the *putto* made in the Punjab, the felted blankets and cloaks of Mysore, the woollens manufactured in Nepal and Tibet are what scarcely escape admiration.

Carpets.—Climate chiefly influences everything referring to the clothing or habitation of man. In the latter, coverings for the floor are necessarily included. Carpets, either of cotton, silk or woollen have long been known in India, though they seem to have been first made in

Persia, whence the art was introduced into this country. The Persians still remain unrivalled in the happy combination of colour and pattern, for which their carpets have long been distinguished. Though printed calicoes of large size and suitable patterns are sometimes used for covering the floor in India, yet the common carpets used in this country are those made of cotton, and called *sutrunjees* of different colour, usually blue and white, in red or orange stripes, squares or stars; some of exceptionally large size. They are thick and strong in texture, the two surfaces alike, smooth and without pile. They are manufactured in different parts of India, at Murshidabad, Rungpore, Agra, Jhansi, Amritsar, Ahmedabad, &c. Woollen carpets of beautiful and well-coloured patterns are made at Mirzapore, Gorakhpore, Bangalore, &c. The rugs from Ellore have been universally admired for their general characteristics of pattern and colouring. Nice carpets are turned out by the prisoners in the Cawnpore Jail.

Silk is another material of which carpets are made in India ; and the pile being of silk imparts both softness and richness to the surface,

while the colours are clear and brilliant. We have silk carpets from Tanjore, Khairpur, Hyderabad, &c.

Lace-making.—Lace is a term unluckily applied to two very distinct arts, one consisting of gold and silver wire or even silk thread, woven into ribands for embroidering cloths. The other is the well-known transparent net-work, in which the threads of the weft are twisted round those of the warp. It may be made of silk, flax or cotton, or even of gold and silver thread, and has usually a pattern worked upon it, either during the process of making the lace, or with a needle after this has been completed. Though much lace is now made by machinery, the highly-esteemed genuine article is made by hand ; and therefore may fitly commence the series of arts which depend chiefly on manual dexterity. Lace-knitting is considered to be a German invention, but lace worked by the needle is of far older date, and was probably an Eastern invention. Lace is made in the territories of the Maharajah of Travancore, and the lace of Nagercoil, which, though knit by natives of the country, has been declared equal, if not superior, to the

best French lace. A few of the European residents are already aware of the superior quality of the lace and use it, but its beauty is well deserving of being more generally made known than it at present is. Gold and silver lace are both excellent of their kinds, but as the demand is limited, and fashion changeable, they might not always command a sale. But the broad black lace on wire ground and the broad white and fine lace on pink ground have been highly approved of by the best authorities.

Net-making, or the art in which the fabric is required to be transparent, but in which the fibres are decussated and retained in their places by knots, that the interstices may retain their form and size, and prevent objects from escaping, seems to have been known in the earliest ages in Egypt and is practised with the greatest skill in different parts of India.

Needle-work.—The manufacture of needles is said to have been first introduced into England, in the year 1540, by a native of India. But the Hindus used the needle very little, inasmuch as they had the art of completely enveloping

the person in long pieces of cloth, just as they come from the hands of the weaver. The needle, applied to sewing, was, however, essential to make the dresses of the Mahomedans, and without supposing that the needle was quite unknown as "sewers of cloth" are mentioned by *Manu*; it is to the Mahomedans chiefly or to other Northern invaders of India that the introduction of the needle and its uses, as well as the art of embroidery, are due. The Arabs, probably, introduced the manufacture of needles into Spain, and Spanish needles were at one time famous. They are manufactured in India from fine wire. The art of sewing is practised in India chiefly by men, who are Mahomedans. They form the class of tailors known as *Darjees*.

Darning (*rifu-giri*) is a branch of the art which requires the greatest skill and is largely practised in different parts of India. The skill of a *rif-u-gar* is exhibited where a defect in a costly shawl is to be made good, or a coarse thread is to be picked out of a piece of muslin into which it has been accidentally introduced. So skilful are some of these *rifugars* that they can extract a thread twenty yards long from a piece of the

finest muslin, and replace it with one of the finest quality. They are principally employed in repairing the muslins and calicoes that are injured during bleaching, in removing knots, and joining broken threads; also in forming the gold and silver headings on cloths.

Embroidery.—This art was known and practised with great skill in ancient times in Egypt, Assyria and Persia. The Israelities learned the art before their exodus, the Babylonians were famous for their rich tapestries, and the Assyrian monuments display richly embroidered robes and trappings.

The finest and best Indian embroideries in gold, silver or silk are made at Dacca, Murshidabad, Patna, Agra, Delhi, Amritsar, &c. The cloth to be embroidered is stretched out on a horizontal bamboo frame, raised about a couple of feet from the ground, and the figures intended to be worked or embroidered are drawn upon it by designers.

On woollen cloths the outlines are traced with chalk, and on muslin with pencil, and the body of the design copied from coloured drawings. The embroiderers, seated upon the floor

around the frame, ply the needle. In place of scissors they commonly use a piece of glass or China ware to cut the thread. In Delhi small shawls and scarfs are embroidered both with floss and twisted silk; in Dacca muslins are embroidered with floss silk of various colours. But Dacca is also famous for its embroidery of muslins with cotton, which is called *chikon kari*. One kind is formed by breaking down the texture of the cloth with the needle, and converting it into open meshes. *Kashida* is the name given to cloths embroidered with *muga* silk or coloured cotton thread: and though generally of a coarse description, gives occupation to a number of the Mahomedan females of Dacca. The beetle-wing embroidery of Madras is particularly elegant, and the velvet awnings, *musnad* covers, *hookah*, carpets and elegant trappings, embroidered with gold and silver, chiefly at Murshidabad and Benares, are admired for richness as for the skill with which the groundwork is allowed to relieve the ornaments. The embroidered saddles and saddle cloths of Patiala, Multan and Lahore are worthy of admiration. But that the skill and taste are not

confined to one part of India is also evident in the table covers made at Tatta in Sind and the embroidered shoes made at Khairpur.

Jewellery.—Workers in iron and steel could never have found difficulty in managing gold and silver, for which indeed the East has always been famous. That the Hindus have long been familiar with the two precious metals, we find in the hymns of the Rig-Veda, where golden armour and golden chariots, and decorations of gold and jewels are frequently mentioned. The art of making gold wire, that is, silver covered with gold, is practised in various parts of India, as Dacca and Hyderabad, Delhi and Benares. Several varieties of gold and silver threads are made at Dacca for the embroidery of muslins and silk, for gold lace and brocades, and for caps and turbans. Much fringe of various patterns is made, and thin tinsel stamped into various forms of flowers, or impressed with excellent imitations of jewels, such as flat diamonds, emeralds and rubies.

Carving.—The term carving is applied to the cutting into particular shapes and patterns different materials, such as wood, horn and ivory.

Wood-carving has long been practised in India for the idols as well as for calico-printing. The carving of the black wood furniture of Bombay has been highly spoken of, especially in the elegance of patterns on the backs of the chairs, and sofas, in the side boards and book-cases. A variety of carving in ivory is made in different parts of India, and has much to be admired, whether for the size or minuteness, for the elaborateness of detail or for the truth of representation. The ivory works of Berhampore, Travancore and Calicut are the most conspicuous. But the skill of the Indian carver is conspicuously shown in the beauty in so soft and yielding a material as pith or what is known as *shola*. For carving on pith only two tools seem to be employed—one a large and heavy knife, the other a fine sharp cutting edge.

Besides these, we have cocoanut shells and gourds carved and made into cups, vases and snuff-boxes; also the kernels of the cocoanut variously cut, for making garlands for festive occasions.

In connexion with these carved works might be mentioned a number of other manufactures,

in which the Indians display great skill and neatness ; for instance, in the boxes of ivory, horn or porcupine quill, ebony and sandal-wood fans and umbrellas, hookah-snakes, imitation fruits and flowers, toys and puzzles.

Among these we ought not to omit mentioning the skill with which the unyielding substance of a hard thick shell is converted into bracelets or what is known in Bengali as *shanka* for the women.

The manufacture of shell bracelets or *shanka* is one of the indigenous arts of Bengal. The material out of which they are made are large concave shells from six to seven inches long, and of a pure white colour. In connexion with these shell-works, we have to notice the works in horn of Vizagapatam, in which the excellent polish of all, the transparency of some, and the elegant forms of others, show that the difficulties of the manufacture have to be overcome a great deal.

Working in stone.—Working in stone, polishing the hardest surfaces, engraving its surface with imperishable records, and sculpturing it into various forms, even excavating gigantic temples

out of the solid rock, are all departments of sculpture and engraving to which the Hindus have paid attention from the earliest times ; and some of the buildings are conspicuous for the exquisite polish and glass-like appearance of the hardest granite. We have elegantly-shaped cups, saucers, toys, beads, models of buildings made of marble, agate, crystals, and cornelians as well as of blood-stones, found in the neighbourhood of Cambay, and which some people think to have been imported from Germany, but of which there is an abundant supply in India, both near Cambay and in the Soane River.

Of the crystal, agate and jade cups of Lahore and Cambay, some are plain and polished, others have their surfaces elegantly carved, and not a few inlaid with precious stones, and all conspicuous for the beauty of their forms.

Those who can give a lustrous polish to granite and mould crystal cups into as elegant forms as the softest clay, can find no difficulty in carving sand-stone or in cutting marble. But the elegance and variety of the patterns into which both sand-stone and marble are cut are con-

spicuous in the open lattice work with which tombs are surrounded in N.-W. India. These are, moreover, remarkable for the light and aerial, almost lace-like appearance with which they impress the observer at a little distance. The marble vases and vessels of Agra, the marble toys of Jaipur, the marble chairs and couches made at Jodhpore are remarkable for elegance of form and fineness of polish ; while the swans and fish of Kishangarh, which though made of marble yet could swim on water, shows the attention paid to the buoyant effects of air when enclosed in so heavy a substance as stone. The stone-work of Gaya also displays considerable skill of the workmen, but the *turning lathe* is employed to give a finish to the external form of the vessels.

Sculpture.—Under the head of sculpture many things are often included which are usually considered to be distinct branches of the art ; some consisting in the art of producing figures upon wood, gems or metal ; while the term statuary is confined to the art of making statues. In former times the rocks were carved out into porticoes, temples, figures of gods and goddess-

es, on a much smaller scale indeed than the Elephanta caves of Bombay, but some of them were very beautifully executed, and are considered as some of the most extraordinary specimens of art in this country. So in the cave temples of Elephanta, the central image is composed of three colossal heads, about fifteen feet in height. These temples as well as those in Central and North-Western India are specimens of sculpture on a gigantic scale and have elicited the admiration of the Western visitors.

Engraving, though defined to be the art of representing objects by cutting wood, stones or metal, is often applied only to such works as are intended afterwards to be communicated to paper, but the term also denotes some ancient branches of the art, as gem and seal, also dye engraving, of which we have some relics of antiquity, which excel in their exquisite polish. Engraving inscriptions on stone is one of the most durable modes of preserving records, and has been practised in India from the earliest times of which we have any notice. The art must have been practised to a great perfection even before the invasion of Alexander.

Every reader of Indian History is familiar with the inscriptions of Asoka. The pillars at Delhi are inscribed and the numerous plates of copper which have been found in all parts of India engraved with grants or agreements for leases of land, and which have proved the most authentic, and in many instances the only records of lines of sovereigns, prove how general has been the prevalence of the art of engraving in all parts of India.

Mosaic and inlaid work.—The art of cutting marbles and still harder substances into patterns and then filling them up with cornelians and precious stones is practised with great skill in the northern parts of India, as is evident from the vessels of jade made at Lahore which are inlaid with rubies, emeralds and diamonds. So the marble inkstands, card-trays, and chessboards inlaid with agates, &c., made at Agra and Delhi are objects of admiration. These articles are conspicuous for the clear and well-defined insertion of the different stones, the delicate and graceful leaf and flower stalks, as well as for the happy combination of colours in the flowers and patterns.

It is supposed that this art must have been introduced into India in the time of Akbar or Shah Jehan ; for in buildings erected by the former at Agra, the ornaments, carvings and mosaic of the smaller apartments are superior to anything in the Alhambra and the marble floor is beautifully inlaid with cornelians, agates and jasper. In the Taj Mahal, erected by Shah Jehan in memory of his Begum, the walls, screens and tombs are covered with flowers and inscriptions, executed in beautiful mosaic, of cornelians and jasper. There are similar works in the palace of Delhi, and India may well be proud of such workmanship of her artisans.

So we find the long-established industries of India even to this day asserting their excellence in a manner at once characteristic and extraordinary. The same skill in metal works, in ivory-carving, in pottery, in mosaics, in shawls, in muslins, and in carpets is exhibited at the present time by the ingenious communities, whose ancestors practised them years and years ago.

But poor India mournfully watches the decay of her famous arts, one by one, before the rapid

strides of the science and machinery of the West !

When will the day of her industrial regeneraton shine forth in the eastern sky and when will Industrial India arise to take a foremost place in the ranks of the nations? Let us, so many of her sons, solve the problem energetically, now or never, and thus raise our motherland on a level with the westerners in matters industrial and commercial.

THE REVIVAL OF INDIAN INDUSTRIES

This is the age of materialism. All over the civilized world there is a craze for money-making almost limitless and ambition boldly asserts itself from every house-top. Go wherever you may, you will find the rush and tension of business life permeating every stratum of society and preparing man to lay his hand on the infinite wealth of nature by bringing to his aid his brain faculties—shaped by education and polished by experience.

But India has hitherto remained a silent and inactive spectator of the great revolution—revolution in trade and industry, which has made Europe and America what they are today. " Help yourselves with what I have scattered broadcast, over hills and dales, in the beds of rivers and under the ground, in forests and over plains, come forward ye sons of Ind ! explore and exploit and you will have aught one

may wish for." Such is the divine command and we must accept it, if we are at all to survive in the great struggle for existence. Just opening our eyes from our deathlike slumber we find that the productive industries of the country are now almost entirely at the mercy of foreign enterprise.

The birth-place of cotton, silk, woollen and other manufactures was India. European traders were first attracted to this country not by its raw products but by its manufactured wares. But to-day, why does the tide of commerce run rapidly against us? Not because the foreigners have made more progress in the delicacy of manipulation,—even with the aid of machinery the beautiful Dacca muslins have not been surpassed by them as yet; but simply by the immense quantity of goods they can manufacture by the substitution of improved machinery for hand power. There is no doubt that had it not been for the invention and improvement of machinery in Europe, India would have still maintained her supremacy. But while every country in Europe was making some addition

to its knowledge in useful arts and sciences, India slumbered in a deathlike torpor, spell-bound and entranced by the accursed superstition which preyed heavily on her strength. The marvellous prosperity of Europe has, to a large extent, resulted from her manufactures, and her wealth has been accumulated chiefly by industrial enterprises. With the introduction of the steam engine things took a different turn in Europe from what they were before.

If we now examine from a social point of view the transformation which machines have introduced in the work of man, we shall be able to state that they have followed two principal directions—one towards the *form* of the movement, and the other towards the *motive force*. In the first direction some progress was made in antiquity, and also in the middle ages, in artistic manufactures and objects of art.

Industry exclusively useful, as it exists at the present day, was then almost unknown, or at least it was hardly conceived as separated from the idea of art. To-day, on the contrary, we attach more importance to the utility and convenience of the form to which art is

often sacrificed. This is the distinctive character of the industry of our age. So long industry had at its disposal, as we have seen, the forces developed by men, the animals, the water and the wind. These forces are by their very nature too limited, too variable; but the steam-engine, on the contrary, develops a force which is in some ways unlimited. If we take a bird's-eye-view of the period which has elapsed since the introduction of the steam-engine, we shall find that the rapid development of machinery is due to the abundance of the new force generated by the expansion of aqueous vapour by heat. The steam-engine has established successively its dominion over a series of manufactures where it continues to make every day new conquests. The weaving and spinning industries may be cited as good examples. In almost all these cases its principal result is to substitute concentration in the place of dissemination of the centres of work. We find the steam-engine when introduced in a manufacture already of long existence, almost always producing the fatal consequences of destroying the petty manufacturer, the labourer who worked primitively

in his home. It is no wonder, therefore, that several millions of artisans in India, specially in the cotton manufacture, have been thrown out of work by the European *machinofacture*, or by the steam-engine which the capitalists only can work to advantage. By the bye, we observe that the principle of *machinofacture* finds itself partially in contradiction with that of the division of work. With modern machine-tools, the co-operation of workmen does no longer consist, in fact, in the execution of a small fraction of the whole work, which increases in sub-divisions as desired by the famous principle of the division of labour. In spite of its brilliant sides, the machine presents to us some dark points which leave us in social anxiety, but there are other examples which appear to us bright and hopeful ; they are those which belong to the important category of *transport by machine*.

Steam-navigation and railways, which are the most important applications of the steam-engine, do not lead the workmen to fatal consequences, and one might say with safety, that they have rendered services to society at large ; though

the West has naturally been benefited by them in the greatest degree.

If you estimate by the *data* furnished by statistics as to what force the steam-engine lays at the service of men, you will find that in Central Europe the consumption of steam in order to give movement to locomotives and ships, represents two or three times as much as is necessary for the purposes of all the manufactures. A large number of working hands find themselves employed in these two modes of transport and in the workshops for the construction of their requisites under the best conditions of health and comfort. This is exactly a faithful picture of what European industry has attained to at the present moment. The action of the steam-engine is more advantageous, that is to say, more economical, the more its force increases.

But as powerful steam-engines are costly and are beyond the reach of many, we advocate the extended use of machine-tools which are comparatively cheap and can be worked either by hand or by some other motive power. Big machinery with powerful steam-engines

will be found highly advantageous when manufacture on a large scale is to be undertaken. Constructed on a vast scale and embodying large capital, big machinery is to be used for the production of wares in great quantity, so that the smallest advantage in the power of working, being multiplied a millionfold, shall turn the scale of profit.

While urging the necessity of setting up factories on a large scale, we must not lose sight of the small industries or petty manufactures as they are called which are urgently required amongst us now. These are the manufactures of soap, cigars, cigarettes, umbrellas, cloth, coir goods, blacking, starch, varnishes, oils, printing materials, cement, &c., &c.

In the manufacture of the following articles machine tools are required, and they are comparatively cheap. Let us take, for instance, the case of the hand-loom. Given this machine the petty weaver will be able to work in his house nearly as well as a great manufacturer. Our readers are no doubt aware that there have been strenuous endeavours within the last few years to improve the Indian hand-loom, and referring

to a hand-loom factory at Amritsar, where a type of Japanese loom is in use, Mr. Havell, the Principal of the Calcutta School of Art, a gentleman who has perhaps done more for the Indian hand-loom weaver than any person, states that by means of this loom the price of hand-made cloth can be reduced to a level at which the power-loom factories cannot compete. Here is an admission by the principal authority that by means of improved hand-looms we shall be able to compete with power-looms. So in spite of the advantages on the side of the big manufacturers, the small manufacturers will be in a position to compete with them.

The moment we are able to give to the petty manufacturer the motive power under fair conditions of economy, practically equivalent to those which secure to the capitalist the engine of great power, we shall, by this very fact, create an important class of industrious people, reinforcing it where it exists and re-establishing it where it has disappeared.

With the question of the petty manufacturer is intimately connected the question of domestic

industry pursued in conjunction with other occupations. This kind of manufacture is happily maintained in certain parts of Europe even to-day, where manufacture on a large scale has arrived at a high degree of perfection. Thus, for example, in France, at Lyons and its vicinity, there are still a large number of weavers practising their craft in their own homes. The same state of things is to be seen in certain parts of Switzerland and Germany. There are already several different petty power-supplying machines in Europe which have proved very successful for machine-tools employed in small industries. We can cite here the most satisfactory types of them, such as lighting gas-engines, the hot air-engines, the water-pressure engines and the petroleum gas-engines. These machines by their very nature are only used to produce small forces. Thus in the limited sphere of action from 1 to 3 horse-power, they can certainly contend with success against the steam or electric engine. This is why they have been ranged among the most important of modern machines, carrying in them the germs of a

complete transformation of certain industries. The water-pressure engine is not always useful on account of its too costly installation. The gas and the hot air engines are worked everywhere. Besides, they are making continued progress.

So at this period when India re-enters into her field of industrial activity, it is proper and essential that the country should be flooded with cheap and petty machines furnished with small motive powers for the domestic industries. The primitive workmen, stimulated to work, and furnished with better materials and machine-tools, will beyond doubt carry on their business with success. Thousands of them have capital enough to start small enterprises of this nature collectively or separately. Thus there will be a wide field even for people of different castes to follow their respective professions to a certain extent, if such reform as is advocated is carried out in our country.

It is very likely that the privileged classes in India will in the long run set aside their ancient traditions and prejudices, and embrace the earliest opportunity of undertaking such enterprises

as are best calculated to satisfy their highest ambitions.

If the remedy proposed in Europe to protect the weavers from the pressure of capitalists be that they should work with cheap motors and thus compete with capitalists successfully, we do not see any reason why a similar remedy for this country will not cause the revival of cotton or silk manufacture. Thus, if petty industries rise up to combat large manufactures, capital will not remain idle and must be invested elsewhere.

The question of the condition of workmen has given rise to anxious speculations in Europe. But in India their circumstances are still more deplorable. Millions of weavers and artisans of different professions are thrown out of work and reduced to coolies in a precarious state of existence. Only a comparatively small number are employed in mills or workshops of construction on small remuneration. The population during the last fifty years has considerably increased, although the avenues of life have been overcrowded and new openings are but few. However, there are bright prospects now in the

exploitation of the resources of the country—such as in agriculture, metallurgy or in manufactures. It goes without saying that it is too early to expect a complete transformation of the present system, considering the ignorance of the people and their opposition towards all innovation. In spite of this deplorable state of things, we can hope to make some amelioration if we work with wisdom. Thus, if the different branches of technical and scientific knowledge are rendered popular, we shall ere long arrive at happy results. With this view, generous people ought to stand shoulder to shoulder and set up commercial and technical schools of arts and manufactures. It is commerce and industry which can bring about a general diffusion of wealth among the lower orders of the people. The resources of a country should be exploited by her capitalists. Indian enterprises in railways or steam navigation, if feasible, will at all events engage a large number of unemployed hands. Besides, the technical schools when established will train the youths in commerce and industry and create in them a confidence which will enable them to

embark boldly in enterprises now closed to them through lack of knowledge. It is an undeniable fact that capitalists in this country can, to a certain extent, stop the influx of foreign goods in the Indian markets, by setting up large manufactories. But that will only bring a temporary relief. The masses will still remain victims of exploitation. The methods which have been adopted in Europe to solve the complicated workman question can equally be adopted at least by all intelligent and active people in this country.

The primitive workmen with better materials will find to do their work with advantage to themselves. What will the capitalists do? Besides the construction of railways, bridges and ships, they will be able to engage themselves in mining, which they would advantageously do with the help of costly steam-engines of great power. The depths of the mines, which are not easily accessible to all, will be explored and ransacked by the capitalists. They will not fail to dig up the materials from the bowels of the earth as rapidly as possible to satisfy the growing demands of manufactures.

It is beyond doubt that this method will be successful and will render signal service to the country. At the first blush, such reforms might appear to be chimerical. But it is clear that the technical schools which will instruct youths in different mechanical arts, will enable them to gradually appreciate these machines and motors. It is the lack of scientific knowledge and self-confidence which hinders industrial enterprises.

The first endeavours made to introduce a reform are always beset with difficulties on all sides. What difficulties have not had inventors to encounter while engaged in the execution of their projects !

So in this new order of ideas the principal duty of ours would be to render manufacture popular by the production of cheap motive powers. The end which one ought to aim at is the sub-division of the industry of this class into a number of petty industrial organisms which, being backed up by organisms of large dimensions, will with the help of the latter bring manufacture to a prosperous state from a social point of view. India ought to take

lessons from Europe in this respect. It is an undeniable fact that industry has been raised to the dignity of science in the West. The mechanical art is regarded as *high labour* by the economists. A competition in industry must, in an advanced stage of civilization, be a competition of intellect. This points to the necessity of adapting education to the wants of the age. The theory and practice of mechanical arts are intimately connected with each other. The one cannot dispense with the service of the other. It has been said in a different connexion that 'capital is work accumulated;' we shall be justified in the same way in declaring that 'theory is practice accumulated'. Science has beyond doubt given an impetus to industry. Hence scientific and technical institutions will give the youth the necessary weapons to fight out his way through life, and enable him subsequently to come out victorious in the great struggle for existence. His general notion of business, and his knowledge of science and arts, will procure him an entrance into the different branches of commerce and industry. He will not flounder in the ocean of

life like a ship without a helm, which lies at the mercy of the wind and the wave.

In summing up we are tempted once again to say that to mechanical skill and well-directed enterprise India must look, if ever, to be raised from her present position to one of almost fabulous wealth and prosperity to which her immense natural, but hitherto undeveloped, resources might yet one day raise her.

PROTECTION IN TRADE

It is as clear as anything that if a country pursues a policy of free trade, it will have foreign goods at a cheaper cost than if its policy is one of protection. If these foreign products are articles of food which the people require or the raw materials of industries, no conceivable harm can be done by their importation. Of all the products of man's labour food is the first essential, and the cheaper it is the better for the people, since no society is altogether free from members who are in want of food. No doubt, cheap foreign bread may cause the culture of the less productive lands in a country to become unremunerative and thus lead to their going out of cultivation. This, though it may injure the farmer class for a time, causes no injury to the people as a whole. The agricultural labourers who may be thrown out of

employment will soon find other occupations, and the less productive lands will remain a reserve for the people to cultivate in time of need. This is practically the case in England. The people of England are like a body of traders and manufacturers settled in an island which scarcely produces the food of half its population, who replenish their food supply and enrich themselves by manufacturing things for other nations and conveying them to the foreign shores.

But suppose a country produces food and raw materials at a lower cost than neighbouring countries and can gain nothing by importing them,—much less manufactured articles cheaply. Free trade will enable it to have foreign manufactured articles cheaply, but will raise the price of food within the country and cause the cultivation of lands which were formerly waste or pasture lands. The effect of free trade then would be to raise the price of food, which is the first essential, and cheapen things which are not so necessary for man. The number of those who suffer from want of food will increase simultaneously with an increase in other com-

forts. The cheapness of foreign manufactured articles will cause many artisans in the country to be thrown out of employment, and they will be obliged to resort to agriculture for a livelihood. This is precisely the case in India. Our persons and apartments are better decorated now than what they were fifty years ago, but, on the other hand, emptiness now reigns supreme in our granaries. This is proved by the increasing number and severity of famines. Certainly no one who considers these facts can pretend that we, as a nation, have been rendered happier by free trade.

Of course the agriculturist does not generally prefer other comforts to food. But the rise in the price of food forces him to cultivate and pay rent for land which formerly was uncultivated; and the big landowners in the country live on this rent amid untold comforts. They are more numerous than they were before, and have now a greater number of luxuries.

The Government of a free country always strives to keep down the prices of food and raw materials. In England, which ismainly a manufacturing country, this result is secured

by free trade. In Germany, the United States, and the self-governing Colonies of England, the same result is secured by raising a high tariff wall against foreign manufactures, which, if admitted free of duty, will destroy home manufactures, and have to be paid for with raw materials. This was also the policy pursued by England in the eighteenth century, when she could produce the food she required. As India is a dependency, our Government has to consult not only the welfare of the people but also the wishes of British merchants, and so it pursues a policy of free trade, unlike the Colonies of England which are similarly situated.

It may be an economic law that people will not buy a dearer and inferior article if they can get a cheaper and finer one. But if we had lived in a self-governing Colony, we would not have got the foreign article so cheaply as we do, for then it would have had to pay a heavy duty. Our power to buy the foreign article at a cheap cost may be said to be the result of our political dependence and is a power to ultimately injure ourselves. Herein lies the necessity for voluntarily protecting *Swadeshi* articles.

English political economists are never tired of arguing that free trade enables each country to produce that for which she is most fitted. This fitness certainly does not consist in the power to produce raw materials, for then England would not have been the greatest cotton manufacturing country in the world, nor would India have been one of the largest purchasers of cotton goods. It consists only in the possession of skilled labourers and the disposition to employ capital in industries. The first of these can be secured by technical education and the second by protection. Students of English history know that it was not free trade but protection and mechanical improvements that enabled England to become a great cotton manufacturing country. Even such an ardent advocate of free trade as J. S. Mill has said:—

"The superiority of one country over another in a branch of production often arises only from having begun it sooner. There may be no inherent advantage on one part, or disadvantage on the other, but only a present superiority of acquired skill and experience. A country which has this skill and experience yet to acquire may, in other respects, be better adapted to the production than those which were earlier in the field; and besides it is a just remark of Mr. Rae, that nothing has a greater tendency to promote

improvements in any branch of production than its trial under a new set of conditions. But it cannot be expected that individuals should, at their own risk, or rather to their certain loss, introduce a new manufacture, and bear the burden of carrying it on until the producers have been educated upon the level of those with whom the processes are traditional. * * * * The expenses of production being always greatest at first, it may happen that the home production, though really the most advantageous, may not become so until after a certain duration of pecuniary loss, which it is not to be expected that private individuals should incur in order that their successors may be benefited by their ruin."

Voluntary protection, like voluntary temperance, is better than legislative ordinance. No vested interests will arise, and no one will have ground for complaint when, after the Indian manufactures have been fully established, the sacrifice is discontinued. The self-sacrifice of their countrymen will rouse in the capitalists a sense of obligation and spur them to introduce improvements and reduce the price. In the matter of cheap labour and raw material India is much more fitted for the manufacture of cotton and metal ware than England. Only the people have to induce capitalists to venture on these undertakings by promising their support.

That nations are capable of such self-sacrifice we see illustrated in the case of the Americans, who risked war with England because England had offered them cheap tea! The Northern States also went to war with the Southern because the latter wished to introduce slaves in the new territories. We have no doubt that the people of India will make a similar sacrifice for some length of time for their own future good.

The American economist Carey has indicated the danger peculiar to the sort of barter which is going on in India. There is no reason why the land should be tasked beyond what is absolutely necessary for the subsistence of the people. The soil is impoverished by cultivation; and the consumers of our corn do not send back to our soil the fertilizing elements that they in a manner abstract from it. The sooner this barter is reduced the better for the people.

WHY FREE TRADE IS NOT GOOD FOR INDIA

It has been pointed out times without number by our economists, with all the force of logic they could command, that free trade is not good for India, inasmuch as she is a purely agricultural country with hardly any of those resources that go to the up-building of an Industrial nation, still it is urged by English economists why, if free trade is good for England, it is not good for India.

Free trade is not good for India for the same reason that it was not good for England in the beginning of the eighteenth century, when Defoe complained that the woollen industry of England was nearly destroyed by the unrestricted importation of Indian calicoes and muslins, and certain kinds of Indian goods were prohibted by law in Great Britain and heavy duties were imposed on others. Our ancestors then had the manual skill which the English lacked, and

it was therefore that a bulwark of protection was rasied in England at the time. The conditions are now reversed, and hence the people of India have begun voluntarily to protect Indian industries as protective legislation is not possible in our case.

Moreover, India is exactly the country where conditions are favourable for a policy of complete freedom within her own borders, and protection against foreign countries. With its enormous extent of 1,507,000 square miles and a population of 300 millions, its infinite variety of climate and production, its fertile soil on which every variety of agricultural produce can be grown, its practically unlimited abundance of raw materials and its vast mineral resources, it is a world in itself, and can afford to dispense with every foreign article either in the nature of luxury or in that of a necessity. Within its own borders agricultural products and manufactured articles of every description will find the markets needed, the only thing necessary being a complete freedom from restraints on transport from one part of the country to another. Thanks to the

wisdom of our British administrators, this essential condition of a flourishing state of internal trade is completely fulfilled in India. The surplus grain of Burma can be transported to Bengal or Madras without restraint of any kind; the shawls of Kashmir can be sold in the palace of Mysore; and the coal of Raniganj is brought and used by the Madras Railway Company. India was industrially completely self-dependent before the establishment of British rule, and so far as we can see, if all foreign imports were stopped to-morrow, India would not starve, as England might possibly do if another Napoleon should succeed in carrying out a plan of commercial blockade against that country. Not only all our necessaries but nearly all our luxuries can be produced within the country.

Unfortunately, however, our artisans have had to face serious misfortunes for nearly two centuries, and instead of acquiring more skill like the English artisans, have lost much of their old skill, and being unable to withstand the competition of machine-made articles, have unduly swelled the ranks of agriculturists. The latter also have lost all other supports except

agriculture. Thus it is that a single failure of monsoon proves so disastrous to them.

Here we may repeat what one of our most prominent merchants, Mr. Jamsetjee Ardeser Wadia of Bombay, wrote to the London *Times* some years ago:—

"When the English people talk of free trade between England and India, and advocate unrestricted interchange of commodities, on equal terms, I am not able to follow them. We are now exchanging commodities, but not on equal terms. I do not see where that comes in. Yours is a rich country, where your institutions are advanced and developed, and your men and women are educated and intelligent, with great facilities for acquiring knowledge. We have no primary education worth the name in India. Ninety-eight per cent. of us are illiterate, and throughout the length and breadth of India there is not a single technical school or college ; and yet we are supposed to be competing on equal terms with you. The industrial race between India and England is run on as equal terms as between your thorough bred racer and a cart horse."

It is well-known that the great economist, John Stuart Mill, made one great exception to the policy of free trade. In Book V, Chapter X of his Principles of Political Economy, he says ;—"The only case in which, on mere principles of Political Economy, protecting duties can be defensible, is when they are

imposed temporarily (especially in a young and rising nation), in hopes of naturalising a foreign industry, in itself perfectly suitable to the circumstances of the country." The reasons are that the advantage enjoyed by other countries in having begun an industry sooner requires to be balanced, that protective duties give a variety to the economic regime of the countries, and that they increase town population and thus give facilities for the improvement of civilisation. It is almost universally acknowledged that the economic conditions of India approximate closely to the exceptional conditions stated by Mill, for though we inherit one of the oldest of civilisations, yet in the matter of mill industries we may very properly be called a young nation, our ancient industries having been almost entirely domestic. Is it then an ecnomic heresy to talk of the necessity of a protective policy in India ?

The chief argument against a protective policy is that it would create vested interests from which the State will find it extremely hard to extricate itself. But that it can so extricate

itself has been proved by the history of England in the nineteenth century. No such argument can, however, be advanced against *Swadeshism* or the voluntary protection of home industries, and we hope our countrymen will adhere tenaciously to this principle till the end is attained.

OUR WOMEN AND THEIR PLACE IN DOMESTIC INDUSTRY

The dull leaden numbness of a deep-seated woe had so long settled over the land, and an utter hopelessness had thrust back into the grim jaws of a fearful Night the wit and the learning, the genius and the love, the wealth and the valour which erstwhile had made the land so thriving and so happy. But, thank God, the glory of a soft radiance in the east has begun to tinge the black edges of the massed clouds which enveloped the expanse of the firmament, and the inspiriting music of a song of Hope has begun to be wafted on the wings of the wind, for the Morn is about to dawn on the Night of ages, on whose lap beloved India had hitherto lain in a deathly swoon. When the whole atmosphere is electric with angel songs of joy, does it behove our women, who adorn the pantheon of our household, to sleep over the activities of the present moment?

They must exert all their energies to avail themselves of the golden opportunity. If they fail to take time by the forelock, all our movements will die of inanition. Hindu women in olden days were often quick in taking the lead in all social and educational movements, but years of servitude, under the galling yoke of foreign rule, have converted them into mere dumb dolls, more worthy of being the playthings of their husbands, than of taking part in any movement. But an electric current of love for "Benighted India" has of late been set in motion into their hearts, and they have become alive to the responsibilities of their lives. Our women have often been made the butt of railing remarks by our white masters, as being ignorant of everything, and given to idle gossipping, but let them see that the scintillations of those womanly qualities that help to raise a nation in the scale of greatness are not wholly extinguished. Our women have already begun to stand by the *Swadeshi* movement. They have begun to instil into the minds of their sons a love for their mother-country by their examples. A good deal of Japan's

present greatness must be ascribed to the Japanese women. Their self-abnegation and fond devotion for their country have been the redeeming element during the recent crisis. Would to Heaven that our women could take in those qualities, to bring about the regeneration of India.

India has now been under the domination and tutelage of one of the most highly civilized nations of the West for over a century. Yet the fact is striking that she should have so signally failed to imbibe the essential spirit of Western civilization, and should present such a deplorable dearth of indigenous enterprise, whether manufacturing, agricultural or mining. All her railways, and the important mills and factories with but few exceptions, have been constructed with English material and English capital, and are under English management.

It cannot be urged that the Indians are wanting in assimilative faculty. Like the Chinese, they have inherited an ancient civilization ; but unlike their celestial brethren, they are not so blindly infatuated with it as to be insensible to the good or the useful side of any

other. The absence of industrial enterprise is probably more marked in Bengal than in any other part of India ; yet English education has made the greatest progress in that province, and all the more important reforms on Western lines which have been introduced into India within the last half-century have been initiated and developed there. The widow marriage movement began there, and the crusade against the caste-system in its preseent form, which has lain like an incubus on the Hindu social structure for so many centuries, has been carried out more vigorously and more effectively there than in any other province. Bengal boasts of intellectaul attainments that can well vie with the most polished genius of Europe.

Nor can apathy be reasonably urged as an explanation of the lack of such an enterprise, though the people are often taunted with it. It is true that, inheriting a civilization which like all other ancient civilizations, is essentially non-industrial, looks down upon all money-making occupations and leaves the pursuit of trade and industries to the lower castes, the educated community of India for a long time, while

assimilating Western culture, did not at all take kindly to Western industry. Our men have been more habituated to the drudgery of quill-driving. Whenever schemes for industrial organization are on foot, and whenever they are asked to lend support to such a scheme, they ususally give the cold shoulder to it. Barren clerkdom has sucked like a vampire the life-blood of young Bengal. Who is to make atonement for their coldness to industrial enterprise? Hindu women should take the lead in such matters. They should so guide their sons by their examples that they may learn to look down upon service, and we believe that in no time they would try to cast about for more promising avenues of employment in trade or other business than the well-beaten tracks of clerkdom, and what could be more promising than those that have raised the Western nations on the pinnacle of greatness ?

Want of sufficient capital and of technical education has always been urged as the bane of all industrial enterprise. It is true that there are a few Rajas and Zemindars who, if they were so minded, might subscribe among themselves

sufficient capital to gradually float a few industries on a befitting scale. But in addition to a general want of high Western education, which they share with the capitalist classes, the majority entertain a deep-rooted antipathy which until recently influenced people of their rank even in the West, where the levelling tendencies of a commercial civilization have been at work for nearly a century.

The absence of the conditions mentioned above renders the prospects of indigenous industrial development in India very dark. Without capital to speak of and without higher technical education worth the name, young India is more to be pitied than censured for its lack of industrial enterprise.

What then is to be done? Are the people of India to sit with folded hands absorbed in contemplation on the abstractions of *fate* or should they be heroes in the strife? Meditation, such as the hermits do on the snowy heights of the Himalayas, can never bring about the industrial regeneration of India; on the contrary, we should throw all our energies into the arena of action.

We should insist on our women taking to domestic industries such as the Japanese women do. It was the domestic industry of these women that helped to place the sinews of war at the service of Japan during the Russio-Japanese War. Our homes should become a network of domestic industries. Our women should help the enterprise by knitting and sewing and other kinds of needle-works instead of whiling away their time in frivolous pastimes and idle talk. If any country excels us in the manufacture of any kind of goods which we need or desire their influx here is inevitable, but if we have the natural productions and the climate in our favour, and only lack the manufacturing skill, would it not be wise to acquire that skill, and by that means establish a domestic industry which would benefit the whole country, rather than to encourage a branch of foreign trade which is profitable to foreign labour? An conomist lays down some views very pertinent to this point. "But a capital employed in the home-trade, it has already been shewn, necessarily puts into motion a greater quantity of domestic industry, and gives revenue and employment to a greater number of the

inhabitants of the country, than an equal capital employed in the foreign trade of consumption, and one employed in the foreign trade has the same advantage over an equal capital employed in carrying trade. Upon equal or nearly equal profits, therefore every individual naturally inclines to employ his capital in the manner in which it is likely to afford the greatest support to domestic industry, and to give revenue and employment to the greatest number of people in his own country." Every Indian lady should be taught something useful. It will enable the wife to make home the more attractive. She will be more intelligent, a better companion and more loved as a mother. Her dormant faculties will be drawn out and cultivated, making her stronger for good; and when the storms of life come, she can brave its dangers, and struggle successfully with its disasters.

Women were famed in ancient India for lace-making and embroidery, and needle-work was a favourite occupation with many of them, wherewith they earned their daily bread. Indian embroidery is done on silk, velvet, cotton,

wool and leather; and the embroidery on wool of Kashmir, both loom wrought and with the needle, is of historical and universal fame. Sir George Birdwood in his "Industrial Arts of India" says :—"In India, we find all the varieties of needle-work that are found in Europe, feather stitch, cross stitch, chain stitch, woven work in imitation of embroidery and cut-work in which the ornamental figures are cut out in several pieces of silk or cloth and sewn on the stuff to be embroidered." That the coloured cloth and rich apparel of beautiful embroidery brought to Tyre and Babylon from distant countries were partly of Indian manufacture will scarcely be doubted, says Heeren. The Sanhita of the Rigveda, which dates from a time prior to the Mosaic chronicles contains many passages which help to throw much light on the favourite occupation of needle-work by our women. The passages, though brief and casual, occurring mostly by way of similes and comparisons in hymns designed for the glorification of particular divinities, are not the less interesting and suggestive on that account. Thus the verse which

describes night as "enwrapping the extended world like a woman weaving a garment" (see Wilson's Rigveda, II, p. 307) gives only a simile, yet that simile refers to a familiar fact. If we turn to the pages of the *Ramayana* we would see that according to Valmiki the splendid trousseau of Sita consisted of woolen stuffs, furs, precious stones, fine silk vestments of rich embroidery and princely ornaments.

The art of lace-making has from the very earliest times been so interwoven with the art of needle-work that it would be impossible to enter on the subject without giving some stray thoughts on the latter.

We have seen that the art was known to the ladies of the zenana in ancient India, and we believe it would be interesting to our readers to know its progress in other countries. With the Egyptians the art of embroidery was general, and in *Beni Hassan* figures are represented making a sort of net ; allusions are made to the effect " they that work in flax and they that weave network." Examples of elaborate netting have been found in Egyptian tombs and mummy wrappings are ornamented

with drawn-work, cut-work, and other open ornamentations. The outer tunics of the robes of State of important personages appear to be fashioned of net-work darned round the hem with gold and silver and coloured silks. Amasis, King of Egypt, according to Herodotus, sent to Athene of Lindus a crosslet with figures interwoven with gold and cotton, and to judge from a passage of *Ezekiel*, the Egyptians even embroidered the sails of their galleys, which they exported to Tyre. Finally Josephus, in his *Wars of the Jews*, mentions the veil presented to the Temple by Herod—a Babylonian curtain fifty cubits high, and sixteen broad, embroidered in blue and red, of marvellous texture, representing the universe, the stars and the elements.

Of lace amongst the Greeks we seem to have no evidence, till the period when from the shores of Phrygia Asiatic Babylonian embroideries were shipped to Greece and Italy. The toga picta, worked with Phrygian embroidery, was worn by Roman Generals at their triumphs and by the consuls when they celebrated the games ; hence embroidery itself is styled

" Phrygian," and the Romans knew it under no other name (opus Phrygianum).

Skipping over the first stages of the Christian era—during which there is hardly any mention of needle-work, if we turn to the middle ages, we would see that spinning and needle-work were the occupation of women of all degrees. As early as the 6th century the nuns in the diocese of St. Casaire, were forbidden to embroider robes enriched with paintings, flowers and precious stones. This prohibition was not general. Near Ely, an Anglo-Saxon lady brought together a number of maidens to work for the monastery, and in the 7th century, an Abbess of Bourges, St. Eustadiole, made vestments and enriched the altar with the work of her nuns.

Long before the Conquest, Anglo-Saxon women were skilled with the needle, and gorgeous are the accounts of the gold-starred and scarlet-embroidered tunics and violet socks worked by the nuns. St. Dunstan himself designed the ornaments of a stole worked by the hands of a noble Anglo-Saxon lady, Ethelwynne, and sat daily in her bower with her maidens

directing the work. The four daughters of Edward the Elder are all praised for their needle skill.

Many of the great houses in England are store houses of old needle-work. Hatfield, Penhust, and Knole are all filled with the handiwork of their ladies. The Countess of Shrewsbury, better known as "Building Bess," Bess of Hardwick, found time to embroider furniture for her palaces, and her sampler patterns hang to this day on their walls.

Cut-Work.

The embroidery, though comprising a wide variety of decoration, went by the general name of cut-work.

The fashion of adorning linen has prevailed from the earliest times. Either the edges were worked with close embroidery—the threads drawn and fashioned with a needle in various forms—or the ends of the cloth unravelled and plaited with geometric precision. Cut-work was made in several manners. The first consisted in arranging a net-work of thread upon a small frame, crossing and interlacing them into various complicated patterns.

Beneath this net-work was gummed a piece of fine cloth called quintain, from the town in Brittany where it was made. Then with a needle the net-work was sewn to the quintain by edging round those parts of the pattern that were to remain thick. The last operation was to cut away the superfluous cloth, hence the name of cut-work.

Again, the pattern was made without any linen at all ; threads radiating at equal distances from one common centre served as a framework to others which were united to them in squares, triangles, rosettes and other geometric forms, worked over with button-hole stitch, forming in some parts open-work, in others a heavy compact embroidery.

The ground consisted of a net-work of square meshes, on which was worked the pattern, sometimes cut out of linen and applique, but most usually darned with stitches like tapestry. This darning work was easy of execution, and the stitches being regulated by counting the meshes, effective geometric patterns could be produced. Bed-coverlets and table-cloths were decorated with these squares of net embroidery.

Pattern books could formerly be had to design these embroideries, but owing to their high price and the difficulty to procure, teachers of art soon caused the various patterns to be reproduced in cloth, and these were termed as samplers and young ladies worked at them diligently as a proof of their competency in the arts of cut-work.

Drawn thread embroidery is another cognate work. The material in old drawn-work is usually loosely woven linen. Certain threads were drawn out from the linen ground and others left, upon and between which needle work was made. Its employment in India dates from very early times.

India led the vanguard in the art of embroidery, as we have already seen, at a very ancient time, when even Egypt was only in its cradle. When she was wallowing in the quagmire of the creative fancies of the art, India had already produced inimitable master-pieces in the art of embroidery, and yet her creative force was far from being exhausted. The Egyptian genius had none of the Indian faculty for clear and well-defined imagery; it betrays a certain

vagueness and want of definition which is not to be combined with a complete aptitude for the art of design. It is the business of the art to render ideas by forms, and a well-marked limit is the essence of form, which is beautiful and expressive in proportion as its contours are clearly and accurately drawn.

Another aspect of embroidery consists of lacework. Lace may be defined as a plain or ornamental net-work, wrought of fine threads of gold, silver, silk, flax or cotton. These laces are worked upon a ground, with a few exceptions, in which cases the flowers are connected by irregular threads overcast (button-hole stitch) and sometimes worked over with pearl loops (picot). All lace is terminated by two edges, the pearl, picot, or couroune—a row of little points at equal distances, and the footing —a narrow lace, which serves to keep the garment upon which it is to be worn. Lace knitting is considered to be a German invention, but lace worked by the needle is of far older date, and was probably an eastern invention. Lace in India is made in the territories of the Maharajah of Travancore, and the lace of

Nagercoil, which is knit by natives of the country, has been declared equal, if not superior to the best French lace.

So great is the profit from the sale of these laces, that schools have been established in Italy for the revival of the art. The revival of the art of lace-making in Burano arose out of the great distress which in 1872 overtook the island. The extraordinary severity of the winter that year rendered it impossible for the poor fishermen, who form the population of the island, to follow their calling. So great was the distress at that time, while the lagoons were frozen, that the fishermen and their families were reduced to a state bordering on starvation, and for their relief contributions were made by all classes in Italy, including the Pope and the King. The charitable movement resulted in the collection of a fund of money, which sufficed to relieve the immediate distress and leave a surplus for the establishment of a local industry to increase the resources of the Burano population.

It is not a rare occurrence to find a young laceworker saving her earning in order to

purchase her little dwelling, that she may take it as a dower to her husband. Nearly all the young men of Burano seek their wives from among the lace-women. The school's diploma of honour speaks of the economical importance of the lace-work "to the poor place of Buran" and the benefit which the gentle industry brings to the inhabitants of the interesting island whose welfare, having passed through a series of undeserved trials, is due exclusively to the revival of its practice on a large scale. In the year 1850 the lace-workers in Genoa began to make guipures for France, and the profit from the export is said to have amounted to Rs. 8,00,000 in one year. In England, the County Council Technical Education Committee have supplemented private efforts with grants for classes to teach the lace industry. The wages of a lace-worker are on an average a shilling a day; under press of business, caused by the demand for some fashionable article, they sometimes rise to one shilling and sixpense.

Such domestic industries in the West have proved mighty levers towards the industrial regeneration of a nation. Why should they not

be so in India? Our women should bestir themselves a little with the idea of such an industry, and if they set to work in right earnest, the grand panorama of India's prosperity will not long remain in the distance. They should help us to protect and restore Indian arts by the aid of their domestic industry. But to do this they must themselves recognize and develop the conception of art. For the shadows of the past are the promise of the future. "Know thyself" was the greatest mystery spoken by the Delphio oracle. And no less striking is the Indian story that carries the same message to our women. Oh what a glorious day would it be when the terrible hush of India's lethargy would be broken, and the rain-drops of a new vigour would refresh the earth before new flowers could spring up to cover it with bloom.

HOW TO IMPROVE THE CONDITION OF INDIAN PEASANTS

Material progress has of late been the watch word of the educated portion of our community; and no object can be more laudable, no pursuit more commendable, than to improve the material condition of our countrymen. The noble principle of patriotism, implanted in us by the All-wise Creator, impels us to seek the advancement of the land of our birth in every department of its organization, the foremost place being given to agriculture, though its claims are often ignored by all save those whose profession it is. We frequently have to hear loud speeches on politics, and declamatory orations on sociology; but the tongue seldom moves on behalf of that class to whose toil we owe our subsistence, and whose interests therefore, should be promoted by us, from very self-love, if from no nobler motive. Should

anybody set up a steam-engine in ardent expectation of rich profits, but neglect the means of supplying the machine with sufficient steam, his project would not appear more utopian, than theirs who device manifold measures for the good of their country, but do not move an inch or stir a single muscle to ameliorate the condition of the land-working peasant, who supplies them with the stamina for work. The poet's words—

> "But a bold peasantry, their country's pride,
> When once destroyed can never be supplied."

convey a universal truth, and challenge the assent of every intelligent thinker. A country may be studded with halls of learning, machines may be set up in it from house to house, as the loom is being done now in Bengal, for the promotion of the arts and manufactures, and its trade and merchandise may flourish, as well they may ; but if the soil fail to produce the necessary food for consumption, the natonal existence of its people will soon be numbered with things of the past : our peasantry, therefore, claim our chief attention. They form the most effective factor in our national entity ; and how

their condition may be improved is one of the most important problems of the day.

We read in the annals of ancient India, that the benefits of agriculture were appreciated by almost every Hindu. The name Aryan was given to our forefathers, only because they ploughed and tilled the land. Agriculture was not the pursuit of only the uneducated and unpolished rustic as now, but substantial merchants and even kings like Janaka were not ashamed to wield the plough. This was a favourite occupation with them, and amongst their other grander pursuits their leisure hours were devoted to it.

And if agriculture was so much valued then, when rich and adventurous merchants visited in their ships the wealthy marts in almost every part of the then known world, exchanging the rich productions of their own country with what they found valuable there, and thus added to its wealth and prosperity, much greater should now be the exertions of our countrymen towards increasing the productive resources of the land they inhabit, when no ships laden by its enterprising people with foreign goods enrich it; and when for our

maintenance and comfort we have to depend solely on what it may produce. True, some useful articles are still imported in foreign vessels, and we are in a manner forced into buying them, never being allowed a voice in the bargain, but most of them are mere toys and trinkets in comparison with the useful and precious imports of the past.

Again, our agricultural productions are not now within our sole command, or at our sole disposal. Indian granaries have often to empty their stores—for no adequate return, however, for the benefit of the aliens ; and the natural, though terrible, result is that the gaunt spectre of famine is a frequent visitor among us ; and as we know full well the deplorable consequences of its visits, it is our duty by every means in our power to keep it off. But what are those means ? Under the present circumstances, we cannot stop exportation even if we will. What must we do then ? The only course left to us is to raise our peasant to a state of solvency. We must help him into a condition in which he will be able to work with a light heart. At present, for all his toil, he has hardly enough to

live upon ; much less has he the means of buying the team of oxen for his plough, or the implement for him to work with ; and no wonder that, unable to find sufficient food for himself and his family, or even if he has tutored himself and them to endure the privation of a half meal, unable to pay the rent for his tenements, he has often to quit them, and seek his fortune elsewhere as a common coolie. This is no exaggeration. We have come across cases like this, which have considerably thinned our peasantry.

The first thing needed of us to prevent occurrences like this, to render our husbandmen an efficient body, is the formation of Co-operative Credit Societies and the establishment of Agricultural Banks. But some may ask, why such innovations, when the ryot has often found, and can still find, creditors in his rich Zemindar or in people who are money-lenders by profession? And in answer to this, we have to point out some great disadvantages attending the present state of things—disadvantages to both the lender and the borrower—the former having to run the risk of loss, and the latter to pay interest

at a rate too high for him. Our agriculturists are, for the most part, in straitened circumstances, and parties advancing loans to them, fearing that they may not be re-paid, provide against all possible loss by charging in each case an interest so high, that the regular payment of it will bring into their hands a sum of money amounting to the original principal. This exaction may be submitted to by such debtors as have no intention to pay their debts; but it is a grievous imposition on those otherwise disposed. Again, it may happen that parties contracting such loans may dishonestly decamp with the money, or may fail to repay it, through circumstances not within their control such as bad harvests, or some other equally unforeseen occurrences ; and in either case the capitalist will have to suffer a dead loss. And should an incident like this often happen, many an opulent money-lender would find his coffers empty, or if he be too wealthy to be impoverished by such drafts, he would surely draw his purse strings so tight as not to let a single coin pass out ; and the agricultural class would, through want of pecuniary help, die out. Nor

should we in that case be permitted to look at the scene unconcerned, for in the event of such a catastrophe, we too should have to suffer from scarcity and high price of food.

But let the peasantry form Co-operative Societies and let joint-stock be started for their benefit and the powers of our soil will be fully developed, the husbandman will have his barns always full, and India will be changed into an elysium.

The peasants applying for loan in a joint body will command greater credit ; and the individual loss of the bankers will be very little in case of defalcation on the part of any one of the borrowing body. Such an arrangement will serve as a link between the capitalists and the rural population, and the advantage will be on both sides, the former finding a safe and profitable investment for their money, and the latter having no usurious exaction to meet on the one hand, nor being handicapped by penury on the other. Besides this, it will be a potent factor in forming and unfolding the moral character of the cultivating class. Knit into a body by a common interest, they

will learn to respect one another's feelings, and to oppose aggression on their rights. The spirit of self-dependence which is so rare among them now, will be soon developed. The open hostilities, or hidden jealousies, that are now common among them, will soon be things of the past ; and there will in a short time grow a sturdy race of honest Indian peasants commanding respect and confidence.

Such agricultural co-operation has achieved wonders in civilised Europe. The condition of the farmers of the British Isles, Denmark, Germany and Italy is one of prosperity. In education, strength of character, and in political importance there can be no comparison between them and the rustic element of our community ; and the experiments of men like Schultz, Delitsch and Cavaliere have been crowned with marvellous success.

Now to come to the practical side of the scheme. India is a very large country, and at once to form these Co-operative Societies and establish these banks, so that they may beneficially work in every part of it, is hardly feasible. We should therefore suggest that the great work

be attempted first within small areas, and to the experimentalists we should say :—Choose some village where the agricultural community is free from feuds, and where its members, in spite of the discouraging influence of their surroundings, still possess some energy and show an aptitude for co-operation ; call a general meeting and try to explain to your audience the benefits of combined endeavour. Try to remove their prejudices, if any; but do not be hasty with them, nor wound their feelings by haranguing on their weakness and drawbacks. Be careful not to make very large promises, lest they should suspect you to be big talkers, and thus be wary to place reliance on your words. After this get up a representative body from among them, the standard of selection being intelligence, patience, forbearance, and rectitude of purpose ; and this body will be your first co-operative society. Explain to them the reponsibility of their position, and its duties; tell them that a village bank will be opened for them to draw money on behalf of the whole community of peasants, for the right appropriation and restora-

tion of which they will be held answerable to the civil authorities. As long as a particular cultivator will abide by their counsels, and remain obedient to their guidance, so long will he receive help from them; but let him once show a spirit of obstinate insubordination, and he will forfeit all claims to their sympathy, and not receive a pice from the village bank.

Now we come to the organization of the village bank. Let a meeting of all the villagers be called at first. Explain to them the poverty of the peasantry, and the necessity for a permanent stock whence they may at small rates of interest draw money according to their needs. Then propose that a small bank be established, the board of directors being chosen from men of merit among them ; that all who can afford be called upon to make investments in it, and that advances be made by it to the peasantry on the security of the village co-operative society. It will be desirable to increase the stock of this bank by contributions from without, if practicable. It should always be the care of the directors to raise money at a moderate rate of interest.

If a village be so small that it is impossible to constitute with its inhabitants a co-operative society or a bank, it will be best to view its interests with those of an adjacent village, if that be large enough for these establishments ; or five or six petty villages may be put together, so that the remedies proposed be practicable.

So much for supplying the peasant with the necessary funds. But money connot do all to secure a good harvest. We know of numerous instances in which the crops of our country have suffered much from too much or too little rain. A season of unusual drought withers them, while excessive rain causing the submersion of the soil, destroys everything on it. Man then to receive his food from the earth, has often to wage a war with the heavens. He cannot, it is true, call down rain, or stop its downpour at pleasure; but he can make provision for the supply of water when not enough and its discharge when superfluous. And cultivators do as much as they can on this head. But unaided by Government their efforts in this direction are but feeble. Let us fancy how poor an attempt an Indian peasant can make towards

the stemming of a torrent, or keeping a sufficient supply of water for his use, and then we shall be able to realize what great good the British Government has done to the country by its works of irrigation. The field of *Dunkuni*, stretching over miles, gave but a scanty harvest, and that very whimsically, before the digging of its canal. Fields now smiling with vegetation at all seasons of the year, were till half a century ago the beds of aquatic weeds, spreading a deadly miasma all around. Proper irrigation is one of the essentials of agriculture ; and as it does not lie in the power of private individuals to do enough towards securing it, we must move Government to make a more extensive provision for it. Should they but introduce the methods of irrigation in vogue in their own country, they would confer on us a benefit that will emblazon their names for ever in the annals of our country. These methods are:—

1. Bed work irrigation. This is the most effective, though the most costly method. By it currents of water can be supplied to level tracts of land.

2. Catch work irrigation, in which the same supply of water is availed of repeatedly.

3. Subterraneous or upward irrigation in which the water in the drains is sent upwards through the soil towards its surface.

4. Warping, in which the water is allowed to stand over a level field till it has deposited the mud contained in it.

In France irrigation has of late years met with great attention. Since 1875, there have been Government prizes for the best irrigated farms. In Belgium also, the Government devotes much of its time and money to this branch of public concern.

Our Government, as we have stated above has not been unmindful of it. It has done much towards irrigating the country, and is expected to do more. Unless Government act as pioneers in this direction, very little is ever likely to be done.

Another improvement is to be made in the condition of our peasants, who are often ground down by the high rent which they have to pay for the land, and the strict realization of which itself sometimes entails great hardships on

them. Let us suppose a case, many like which we have come across in the history of rural Bengal. The ryot has had a bad harvest for some years in succession owing to circumstances on which he had no hand ; and he has failed to pay the rent of the soil and the tenements he holds, and is indebted to his landlord for a large sum. The latter demands the money, is put off from time to time, and at last goes for relief to a civil court. And behold the consequences. The farmer who only half a dozen years ago was very prosperous, becomes a bankrupt to-day having no thatch to shelter his head, no soil to till for his bread. Something must be done to prevent such things from happening.

The bank, of which we have spoken before, may not, in addition to supplying the poor ryot with funds to push his business, contribute anything to make things square with the landlord. What must then be done to provide against such emergencies ? A rent for the use of the mere soil may be fair on an average, but through failure of crops for a number of years successively, the realization of it will entail

bankruptcy on the tenant. Certain new privileges must be given to our peasantry similar to what those of Europe enjoy. In Germany a large portion of land is held always as peasant's property, entirely free from any dues. On this principle were the reforms of Stein and Hardenberg made in Germany. They gave to the peasants the power to become land owners. Between the nobles and their tenants, they divided the lands in absolute property, the former retaining one-third, and the latter receiving two-thirds. Common rights and rents were made purchaseable. And the laws of 1824 and 1850 sanctioned the division of common lands among all who had previously an interest in them. To help the peasantry to pay up the dues still payable to their former landlords, land credit banks were started in 1850, advancing to the peasant owner the money necessary for buying up the old rights over his property. The advance thus made constituted the first charge on the land, and was represented by debenture bonds for small amounts. The owner might pay to their credit at whatever time, and whatever sums he was able, by instalments towards

their redemption ; but he was bound to redeem them fully in 50 years. These reforms have converted large parts of Germany into the property of small owners dwelling in and tilling their own lands, free from obligation to anybody. The tenants attached to their holdings form the most stable element in the commonwealth of Germany. This communistic principle has struck deep root in the minds of large classes of people, and it is opportune that we should give it a trial in India.

In Great Britain and some other countries, the doctrine of the supremacy of private rights prevalis. The State by the regulations and force of which property is maintained, must have an unqualified right to prescribe the conditions under which it will confer its gifts on private individuals ; but, on the other hand, this "nationalization" of the land gives rise to many attendant evils. The State may be actuated by a desire to subserve its own selfish ends. It may not care for the distresses of the cultivating class.

To further the interests of agriculture a Board should as in America be constituted, to enquire

annually into the condition and prospects of the Indian peasant, and to provide him with the best appliances of modern science. Let each of the main political divisions of British India have a Board of its own, consisting of a dozen men of acknowledged proficiency in science. Men who made agriculture their study in Europe and America, and whose help is available should receive the first invitation.

In conclusion we have, on behalf of our peasants, to recommend such sanitary measures as will lead to the improvement of their health, the chief stock-in-trade they have. It need hardly be said that the rural population of Bengal, if not of the whole of India, have degenerated into mere skeletons, through the ravages of malaria and other fevers. Since the plague made its appearance in India, thousands and thousands of the peasantry have been carried away; besides that, every year the inroads of cholera and small-pox are great indeed. The people of towns are indeed subject to the attacks of these fell diseases; but they with their municipalities and improved hygienic precautions are better able to show a

bold front. Who will gainsay that bad water is the chief vehicle of microbes, so fatal to the human system ; and that only this water the rustic people of the interior have to drink ? The best sort of water they can get is that from tanks, not, however, unmixed with foul excretes ; and this falling short in the hot months of April and May, they have sometimes to slake their thirst from trenches and pools choked with noxious aquatics ; and what wonder that these months bring typhoid and cholera with them?

If therefore we want a strong and sturdy body of peasants, we must take measures to ensure them the use of good drinking water. The importance of this was deeply felt by one of our Bengal Zemindars, who is no longer in the land of the living, and he made it a point to excavate good tanks in almost every village in his Zemindari. Babu Joykissen Mookerji was a model Zemindar in this respect. People used to say that he was rather exacting in the realization of his rental; but he knew how to fatten an animal before making a feast of it, and is worthy of imitation.

OUR MINERAL RESOURCES

Whenever we reflect on the past glories of India, our hearts begin to beat with a sense of elation, not unmingled with a few thoughts of sorrow at the grim spectacle of her downfall from the height of civilization. The industrial activity of our forefathers the Indo-Aryans, when seen through the misty vista of by-gone ages, presents a graphic picture of aspiration to ride topmost in the rung of material progress. How different is the situation of modern India ! But every sable cloud has a silver lining, and happily for us, India now seems to have shaken off her ethargy, and as a sign of the times, some modern Indian industries have, within a generation or two, assumed considerable proportions, and already become formidable competitors to the sister industries in England and the Continent of Europe. There can be no denying the fact that all over India there is a consensus of opinion on this

point of the necessity of national efforts being made to regenerate India industrially. Our manufactures not only find a ready market here, but are also exported to foreign countries in considerable quantities. But under an inscrutable irony of fate, the development of the latent wealth and industrial resources of India falls very short of the magnificent potentialities of the Empire. Our once flourishing industries have been crushed by unrestricted foreign competition. Old slag heaps are still to be found throughout India, testifying to the former prosperity of such industries; the splendid native iron and steel have been superseded by inferior material of foreign manufacture. Ball very pertinently remarks in his "Economic Geology of India;"—"Were India wholly isolated from the rest of the world, or its mineral productions protected from competition, there cannot be the least doubt that she would be able, from within her own boundaries, to supply nearly all the requirements, in so far as the mineral world is concerned, of a highly civilized community." Whatever be the reasons that may be assigned for the present helpless condition of our people,

who have not been utilizing the mineral resources and energy available in India, the main point we have to consider is that we cannot blink over the importance of the mineral wealth, and as such it should be our endeavour to know how best to utilize it.

Coming now to the definition of the subject, we may say that natural objects which are homogeneous in their mass and in which no parts formed for special purposes can be distinguished are termed minerals. Mineral bodies occur in three physical conditions, *i.e.*, solid, liquid, and gaseous. Those now found in the last two states are few in number and are of altogether inferior interest to those which occur as solids: but there is reason to believe that the minerals we know as solids once existed in the liquid state, and that their present structure was determined in the process of solidification.

Our countrymen have a very meagre knowledge of the economic value of minerals. Out of innumerable mineral species found and described, only a small number of them seems to have any economic value at present. But by further explorations and study the number

may augment, adding much to the present stock of knowledge in regard to their properties and the consequent tendency of the trades to utilize them in arts and industries. The ancient Aryans were not without any knowledge of the economic value of minerals, inasmuch as we find passages in the *Vedas*, the *Institutes* of *Manu* and the writings of *Kalidasa* that go to corroborate the truth of such statements. That India abounded in good and precious stones may also be testified from the writings in the Bible; certainly the port from which Solomon received the treasures of gold, ivory and precious stones was in India. Even Pliny and Herodotus allude to them. We thus see that the economic value of minerals was known to mankind from a very ancient time.

Mineral aggregates occurring in Nature are called rocks. Some of these are like building stones, having economic value as well, and are therefore utilized in arts and industries. Before making any attempt to exploit the mineral wealth of India, we should try to know those mineral aggregates that are of economic value and are utilized by man. We

should also enquire into the special characteristics of the minerals so utilized and know by what operations and processes those characteristics are most efficiently brought out and made most readily available for immediate use. We should also possess some knowledge of the magnitude of the world's trade in them and know in what part of the world the raw materials are plentifully found and worked and which is the most extensive market for the raw materials or finished products. These are some of the items of vital importance of which any person wishing to embark in the scheme of reviving the mineral industries of India would do well to take note. A person having business capacity, instead of treading headlong on the "mysterious tracks" of such industries, would do well to determine first the "open seasame" that would help to give him an insight into them The knowledge so acquired will be made of much avail by imparting to it a practical bearing, and this will help him to choose his material, determine its quality and probable quantity in a preliminary way, prepare its

product and then find out and secure, if necessary, a market for the material or create one, if possible also work out the quantity likely to be consumed in a given time and the total value that will be realized by sale. He will then have to calculate the cost of winning, and working and transporting his material to the market on a large scale, and finally begin his actual work of mining out his raw material, preparing it for the market and transporting it thereto.

Minearls and mineral substances of economic value fall under two classess; (*a*) metallic minerals; (*b*) non-metallic minerals. By the former is meant those minerals which are dense and opaque and which shine like metals, out of some of which the various metals are extracted, such as gold, silver, copper, zinc, iron, manganese, etc. The demand for these is so great that the comparatively small level extent with greater or less persistance downwards into the bowels of the earth makes deep underground explorations necessary. These processes of mining require a large outlay on machinery and on the employment of highly

specialised and expensive supervision and skilled labour. Hence the processes of mining and extraction of metal in regard to these may be styled the higher mineral industries. The class (b) of non-metallic minerals is sub-divided into groups, the members of each group being put to one definite use in the several arts. These fall roughly into twelve sub-classes, to wit, (1) gems and precious stones; (2) fuels such as coal, coke and petroleum gas; (3) structural materials, such as building stones; (4) road-making materials; (5) borax, salt, gypsum, sulphur, etc.; (6) mineral waters; (7) fluxes; (8) mineral paints, such as ochre, amber, zinc white, etc.; (9) fertilizers, such as phosphates, gypsum, etc.; (10) abrasives, such as emery, garnet, etc.; (11) refractory materials, such as asbestos, mica, soapstone, etc.; (12) miscellaneous, such as felspar, etc. The capital needed for these is comparatively small; the expert supervision and advice is not so expensive and the skilled labour needed may be available in India, or the workmen may be easily trained by a few experts first engaged. These may, therefore, be styled lower mineral industries.

Let us now see the vastness of the world's trade in minerals and mineral products. Imagine the deplorable plight of Australia prior to the gold discoveries. Comparing her present condition with the past it seems as if she has had to pass through a metamorphosis. The population has increased by rapid strides. The gold discoveries attracted a large number of labourers to Australia, and the diverse industries that were in their bantling state began to flourish. Similar was the state of affairs in California. The Mysore mines have given an enormous output of 603,074 ounces of gold, exclusive of extracts of gold recovered from plates and slags. Thirty-four crores of rupees worth of silver was produced in 1902, Mexico and the United States together producing about 70 per cent. of it. Nearly 39 crores of rupees worth of copper was won in 1902, nearly one-half of which was contributed by the United States, one-tenth by Spain and one-thirteenth by Mexico. Sixteen thousand ounces troy of platinum was the world's output for that year, valued at nearly five lakhs, 90 per cent. of it having been supplied by Russia. Similarly, let us take a bird's-eye-view of the

world's production in some of the non- metallic minerals and mineral products About 16,000 tons of corundum was utilized by the United States in 1901, its value at the place of production working to about 150 rupees per ton. The production of petroleum in Burma and Assam amounted to nearly 57 million gallons in 1902, more than 54 million gallons having been of Burmah production. The average production of saltpetre in Bengal, that is, in Behar, is stated to amount to only about 222,600 cwts. But the production is grossly understated, for the average annual exports of refined saltpetre from Calcutta in the last five years amounted to 369,444 cwts., and this represents a much larger quantity of crude saltpetre.

The present condition of India imperatively demands united action on the part of our people in finding ways and means which will enable us to compete with the various nations with whom we are now brought into contract. This is our national duty. It is, no doubt, a trite saying in ecnomics that demand for commodity is not demand for labour, but it is equally true that a demand for a particular commodity

gives a stimulus to the production of that commodity. At the same time our efforts are always dependent upon and limited by our wants and desires, and material prosperity was never built upon asceticism and abstemiousness. We are essentially for progress in all directions, and we cannot afford to go downward in the scale of living. We have only to do our duty by utilizing our opportunities to improve our condition by a combined effort and that on a large scale. The Indian wants to increase the producing capacity of his land, and also wants to increase his purchasing capacity wherever it is desirable and possible to do so. He wants shelter to live under and clothing to protect him from the inclemencies of the weather. He wants implements for agriculture and house-building, vessels for storage, utensils for cooking, and lastly, he wants ornaments, personal decoration and other luxuries. Activities of various kinds are, therefore, necessary to meet his demands.

It would not be too much to say that minerals and mineral products play an important part in these activities. The agriculturist of

other countries uses some mineral products for his manure. The insoluble phosphatic minerals found as nodules in the earth are ground and treated with sulphuric acid, for the purpose of rendering the phosphates soluble in water, and therefore easily accessible to the plant. Some deposits of these phosphatic nodules occur in the cretaceous rocks of Utathur and Trichinopoly. Gypsum or hydrated calcium sulphate is also used as a manure for various purposes. It has been recently found to vastly increase the yield of indigo, so that a large demand seems likely to arise for gypsum. Planters and others engaged in the cultivation of indigo in India may find gypsum of much use to vastly increase the yield. Again, plaster of Paris is obtained by calcining gypsum. The powder thus produced gradually sets after addition of water and expands slightly as it does so. It is this property which is exceedingly valuable in making casts and moulds. In the manufacture of porcelain it is extensively used for moulds and for grinding and polishing. It occurs abundantly but in an impure form in the cretaceous rocks of Trichinopoly, in the clays

of Chingleput and in some parts of the Deccan. Impure saltpetre or nitre is much appreciated as a manure for wheat and tobacco.

Coming now to the income accruing from these we see that about 43¼ lakhs of rupees worth of pure saltpetre was exported from India during the official year 1902-03. It is the only chemical product of any importance exported from India. Besides this, we find extensive deposits of copper pyrites in India, which are utilized in the combined production of copper and sulphuric acid, and the still further manufacture of the phosphatic deposits of India and adjacent countries into superphosphates, would open a highly lucrative field of enterprise for India.

We need metals to prepare our tools of husbandry, utensils, etc. Iron is the most useful of metals and next to it comes steel. Iron smelting seems to have originated in India. Enormous deposits of iron occur in many parts of India. If iron smelting by coal and by electricity becomes successful in India, as we have no doubt it will in a short time, a good advance will be made, and the enormous drain

of about six crores of rupees to buy iron and steel implements from Europe would be saved.

Roughly speaking, about 2½ crores of rupees worth of copper and copper manufactures were imported into India during 1904. There are plenty of ores of copper in India of good quality and they admit of their being worked on a commercial scale. Copper ores occur in several places in the Chanda District of the Central Provinces, and there are at least three places in the Multahsil where mines were worked in ancient times. Copper ores are also found in several of the Independent States of Rajputana and also in the British Districts of Ajmere, where mining was practised on a large scale.

Lead manufacture has proved a very thriving business in the Western countries. Lead and lead manufactures of about 25 lakhs of rupees were imported into India during the years 1900-01. The figures show very clearly that our total demand is large. The question naturally arises, have we no lead mines in India? Ball in his "Economic Geology" very ably answers this question. "Although at the present moment there are no lead ores largely worked in

India, there is probably no metal of which the ores have been formerly worked to so large an extent, excepting those of iron. This is testified to by the extent of the ancient mines in Southern India, Rajputana, Baluchistan and Afghanistan. In some of these cases the ore may have been chiefly sought for, for the silver which it included." "In the Madras Presidency lead ores have been found in the Districts of Cuddapah and Kurnool, and in the Sandoor hills in Bellary." Thus we see that a large quantity of ores can be obtained in India. We have only to think carefully if it will be profitable to work the ores in India with our money and skill.

Mercury, again, plays a most important part in the industries of Western countries. It is a metal of high value and can be extracted from its ore without much difficulty. In the year 1858 the Madras Government was informed of the existence of mercury in a bed of laterite at Cannanore. A recent issue of the *Mining Journal* mentions that a large deposit of cinnabar is reported to exist at Devils hill between Tellicherry and Cannanore.

Tin and platinum are found in abundance in India. The former occurs near the village of Patargudiem and also in the district of Hazaribagh in Bengal. The latter has been found in the Tair River in Jammu territory and in the Cabul river at Naushera. It is also reported to occur in Burma, and the Burmese are said to be capable of manipulating the metal.

In the year 1902-03, the imports of glass and glassware into India amounted to nearly 95 lakhs of rupees. The raw materials of the glass are quartz, sand, redled, pure calcic carbonate, baric carbonate, sodium salt, potassic salt, manganic oxide, &c. There is a thick bed of pipeclay suitable for crucibles between Terany and Kauvery in the Trichinopoly District. A fine plastic clay occurs in South Arcot District, in the Cuddalore beds. Beds of white silicious clay occur in many parts of the Rajmahal hills, which can be well utilized for hard pottery. Salts of calcium, sodium and potassium are found in abundance in the rich soils of many parts of India.

Perhaps many of our readers know that India produces mica on a very large

scale; yet it is strange that there is little home demand for it now. Manufacture of mica is a trade of much commercial importance. The extraction of mica has been an industry in Bengal for a considerable period, and recently this mineral has been worked in Madras in some quantity. In the year 1904 it was mainly exported, the export being 1,021 tons valued at about 13 lakhs.

The production of manganese commenced a few years ago, the product being shipped to England. India now ranks second amongst the manganese producing countries in the world. These ores are found in abundance in the Central Provinces.

It is strange that in spite of the productivity of the land, India shall be among the poorest of the countries. Our lethargy during the dark ages through which India passed subsequent to its rule by the Hindu kings and prior to British sovereignty has been pronounced as the ban which had driven all indigenous industries from the land. It should be our earnest endeavour in these days of the *Swadeshi* movement to open the eyes of our people to the imperative need

of industrial activity in this line. Joint-stock enterprise should be made to float companies with a large capital to enable our men to take a keen interest in these concerns. Such companies should seek the advice of experts in England, Germany and America.

The rapid development of the co-operative effort in Japan has brought about changes in the economic conditions of the country that have been almost revolutionary in their character. Not only has it effectually checked the serious consequences that seemed to be impending as the combined result of agricultural depression and national misfortunes, but the general position of Japan to-day is one of greater prosperity than ever; for the Japanese are deriving more advantage from the extremely limited amount of soil they now possess. We as a nation shall be able to make any headway in the sphere of greatness only when we shall be able to imitate this Japanese spirit of co-operation.

HOW TO EDUCATE OUR CHILDREN ?

This is one of the most important problems one has to solve under the present state of things, when all departments of activity and usefulness are open to young Indians, whatever may be their nationality or caste. Time was when each caste had a profession of its own, which it could not give up for another, however profitable this might be. The Brahmin cared to initiate his sons into only their sacred offices, the performance of which stood them in good stead in securing for them a decent livelihood; the Kshatrya tutored his hopefuls in the tactics of war, and the Vaishya and the Sudra brought up their sons in their own trades. Boys were brought up early in life, so as to qualify themselves for their future vocations. But times are changed. No class has now to move in a groove marked for itself. Opportunities are given to all to contest in a common field.

Education in the arts and sciences is no longer the monopoly of the higher castes; nor is trade, or the development of the Industrial resources of the country, confined to the lower. From the *Brahmin* to the *Sudra*, every one has a chance of following any profession he likes. There is a common track for all, no matter to what castes they belong. So there is no longer the necessity of restricting a particular routine of education to one class, and a different one to another. A common plan of education will suit every class; and it is our object here to show what that plan should be.

We cannot come to this at once. One must have a clear idea of what education is before discussing how, and in what way, it should be given. The act of educating is not external, but internal, with regard to its object. Education means something very different from what it is usually supposed to do. Many a father thinks that to educate his son, is to place him into a school, and place within his reach the means necessary for him to learn his lessons there with an easy mind. The "puling schoolboy with his satchel" soon

masters the rudiments, grows into a young lad, and has higher subjects to learn. Geography, History, Grammar, Algebra and what not, are introduced as subjects for his study ; he takes a fair position in class, and great is the joy of his father to see him advancing. The bridge over which many lamentably fall, the Entrance Examination, is passed, next come in order, the F. A. and the B.A. and the M.A. too; but for all this, we should not be in a hurry to regard him as fully educated. Some graduates have been known to have disappointed their guardians, being no better than "graduated fools" who cannot say bo to a goose. Educating a boy is not stuffing his mind with facts ; it is an operation on his mind : and the work of the educator can be best imagined if we keep in mind what to educate means. To educate, train, or bring up a boy means the same. The first means to draw out the powers of his body, mind, and soul ; the second is to draw them out so as to put them in the way of proper and healthy growth. We train a plant when we bend, and lead it so that, with the help of proper supports,

it may grow ; and we train the young when we put them into the position from which they may grow into good and useful men.

Now to successfully adapt our training to the needs of our boys, we should divide the time of their tutelage into these distinct periods :— 1st when they are mere boys too young to be sent to school ; 2nd from their admission into schools, to when they are fit for University Education ; 3rd from the commencement of their University career, to their admission into some profession. But the three distinct courses are not, and cannot be available in all cases. College education or full school training is confined with only the higher or the intellectual classes. Many have to work for their bread, even before they have passed their teens ; and in such cases only home, and a few years' school training, are possible.

The first period, or the period of home training is perhaps the most important of the three periods stated above ; and can be utilised by all. The rich or the poor, the learned or the unlearned, are equally responsible and equally able to turn their nurseries into establishments for

the training of their boys; and the juvenile mind can be so exercised and developed as to be benefitted for further exercise and development in future. On the course a sapling takes, and the growth it gets, depends its strength and usefulness, when it will turn into a tree. Let parents therefore begin to instruct their children, or guardians their wards, as soon as the young minds of these can think.

And the instruction at the early stage is to be given in the easiest and gentlest way possible. It is to be imparted when the child is engaged in play, when it nestles in its mother's bosom, or when it seeks its father's company. Parents should not remain content with giving only physical nourishment to their sons. They should adopt means to put these in the way of thinking; to call into play the intellectual and moral powers in their germ.

Children are, as a rule, of an enquiring state of mind: hardly anything happens in the domestic circle, or anything attracts their attention, into the why and how of which they do not inquire. Curiosity is one of the chief and useful traits in young minds. What hunger is

to the body, so is the desire of knowledge to the mind ; and it is no less cruel not to satisfy this desire, than to deny the child its food. Let no parents then snub their children when they seek knowledge, let them be ever ready to enlighten the tender minds as to the nature of the things surrounding them. Many parents get vexed at the many questions their children ask them; they discourage curiosity in the young. But this conduct is highly reprehensible. Curiosity is a principle implanted in man so that he may increase in knowledge, and to check it is a sin. No father is worthy the name, if his heart does not dance in joy at the intelligent questions his children may put to him. True these may at times be too difficult for him to answer, but this ought not ruffle his temper. Let him admit his ignorance, and impress at the same time this truth on the enquiring minds, that there are many things in this world which we cannot solve ; but when the questions asked can be answered by him, let him gladly seize the opportunity of imparting as much instruction, as he can, through his answers. The child's curiosity gives its parents, the occasion

to train it up. We can then begin the work of instructing our children by taking advantage of their desires to know. We may also create such a desire in cases in which it is not forthcoming.

Another method of imparting healthy training to the young is by telling stories. Boys and girls are mostly fond of hearing these ; and it should be the care of every parent to select such as would contain the best moral lessons, and to narrate them in a way most impressive. The character of a nation is reflected on its nursery and folk and mythological tales ; and as the Hindus have from early times been a nation famous for their great wisdom and high morality, these tales of theirs are very instructive.

A series of learned lectures on the evils of polygamy, would not so much expose the fault of this system, as one tale describing the unpleasant experiences and vexations of a *rajah* with two wives—the *Doa* and the *Shoa rani*. What Indian child would not be fired by a spirit truly heroic, on hearing the mighty deeds performed by the Pandavas of the Mahabha-

rata, or terrified by the effects of the inordinate cupidity and malice of their antagonists, the Kauravas? Instances might be multiplied till their number rose to a legion. But there is no necessity for so doing. One spirit pervades through all of them, and that is to present before the minds of the young hearers, moral truths not in the abstract, but as they are practically illustrated in life. The inductive method of instruction is more successful than the deductive, and that is the method followed in teaching the young through stories. The best and most successful men in the world, are generally those that have had the best traits of human character, exhibited to them by their parents in the stories told them.

The character of a child may be formed also by taking the commonest things in life. Habituate it to moderate, and regular meals, and it will learn moderation; do not permit it to fret on any account, and it will learn contentment. Teach it to act for itself in cases where it will be safe to do so, and it will learn self-dependence. Over-indulgence given to childern has been known to have turned them in after

life into self-willed slaves of their appetites. Rioting mobs, gluttons, and wine-bibbers—worse in character than even the worst savages—consist chiefly of men who in their boyhood were not taught to curb their passions.

In training our young, we must work on their different needs, and susceptibilities. First of these, come the appetites. These must be trained till our children can chose their own bill of fare, they must be guided and controlled in the selection of food; for innumerable will be the evils, if they be permitted to eat anything and in any quantity they like When parents feed their children without having an eye to their health, they pervert their appetite, injure their constitution, and send them adrift into the world as so many wrecks of humanity. It would be no exaggeration to say, that now 95 per cent. of young Bengalis are dyspeptic. The reason is not far to seek. In place of the simple and healthy food that sustained the baby two or three decades ago, numerous unwholesome though palatable dishes have been substituted. If a Bengali matron gathered to her fathers say 25 years ago, were to revisit her home, how

much shocked would she be in finding her grand-children sipping the stimulating, and in their case, often the bile-vitiating tea, or eating the high-seasoned condiment, imported lately into the country. Why in Bengal alone, throughout the whole of India, there has been created in children a morbid taste for delicacies, and when parents injudiciously gratify it, great is the harm they do. Almost every case of chronic indigestion, bad liver or nervous irritability in young men and women, is attributable to the dietary mistakes committed by their parents when they were young. And under these circumstances it will not be out of place here, to give a few rules with regard to the wholesome feeding of a child.

First : For the first year of its life, give it only the food that Nature has provided for it—its mother's milk if she be healthy ; and give it in moderate quantities at certain fixed intervals. Many a Bengali mother is ignorant of this. She nurses her child every time it cries or appears restless ; and even when she can herself supply enough milk from her own breasts, she substitutes for it cow's milk, in her ignorance

believing, that the latter is more nutritive than the former. This substitution of cow's for mother's milk, and this irregular, and too frequent feeding, are the sure causes of so many diseases and deaths among children. The germs of disease with which the system is impregnated in child-hood by such bad feeding do not develope soon enough to do their fatal work in this stage ; their baneful work is but put off a few years later. Secondly, a child should be weaned, at the latest, when it is a year old ; then it must not be fed only with milk, but must have some simple starchy diet. Some mothers have learnt to feed their children with barley cooked in milk ; but the majority still look upon milk as the only food to be given to the young.

In most families, especially the well-to-do, the quality of a child's nutrition is judged from the seers of cow's milk given to it ; and woe to the mother who is compelled either for want of means, or by medical advice to feed her four years old baby with other food. But this idea that a child must live on milk, and milk alone, till it has two rows of well-formed incisors, molars and grinders is rebutted by the Hindu Shastaras.

For what is *Anna Prashana* (the first putting of rice in the mouth of a baby) but its formal weaning,—a ceremony performed when it is 8 months old ? Let the Indian mother understand *Anna Prashana* as it is intended to be, and in the feeding of her child, let her substitute some starchy food for her favourite milk ; and we are sure she will never have to mourn for her darling's early death, or to pass anxious hours in watchfulness over her darling's shattered frame. It should be here understood that for weaned children we do not prescribe the same food as for adults. We do not say that they should have all the dishes in common with young men. All that we mean is, that after a child has been weaned, it may have twice in the day, at breakfast and in the evening meal, sago, arrowroot or barley cooked in milk, a little fish or vegetable soup, with a few grains of boiled rice. Between the two meals it may have at midday a cup of milk or a piece of some good biscuit.

Thirdly, when a child is 5 years old, it must be habituated to the articles of food, grown up persons live upon. The only thing to be careful

about, is that children of this age neither over-eat themselves, nor take a belly-ful of rich food. The hours of nightly rest must be regulated by the nightly meal. No boy or girl should be sent to bed before two hours have elapsed after the evening meal.

The preceeding directions if followed carefully will ensure the health of our young. And when this has been gained, we may be sure of success in our endeavours to train them up intellectually and morally. For physical health is the ground work of all instruction. A diseased body hinders the growth of the soul.

When we shall have attended to, and as far as possible, answered the questions put to us by our children, when we shall have by means of stories, communicated to them certain moral principles, the work still left for us will be great. A moral sense awakened by such stories will be based purely on utility, if we discard from our consideration the question of the existence of conscience as a moral faculty implanted in us by our wise Maker. From a story we can show the excellence of honesty, in as much as it

always stands in good stead all those that practise it. But there is still wanting the proof of the fact that honesty like other virtues are good in the abstract. It should be explained to the young and firmly impressed on their minds, that we should follow a particular conduct only because it is right to do so, or in other words only because God wants us to do so. The chief and the fundamental article we need place before our boys or girls, is that there is a God existing, that he loves us when we do the right, and is displeased with us when we do the wrong; and that true manliness and happiness consist in doing His pleasure. Let one awaken in the minds under one's instruction, the fear of God, the sense of moral responsibility, and one may be sure of very bright results in the future. We must therefore make our children godly, if we want them to be wise, good, useful, and happy members of society. The highest ideal placed before them should be that God is the master of the world, that the *summum bonum* of life is to glorify Him, and that the best way in which we may do this, is by using rightly the talents He has given us,

by improving all our powers, physical, intellectual, moral, and spiritual.

This brings us to a question of vital importance—how far are we justified in holding out to the young promises of reward for the fulfilment of duty and threats of punishment against its non-performance? This is a very delicate question. It has always been the custom of world to promise rewards to merit, and punishment to demerit; and we cannot have the courage to run down what it has sanctioned, nor can we foster in the young the spirit of dutifulness as enforced by such a conventional rule alone. We must take a middle course. We must tell our children that they must do their duty, because God wants them to do so and keep themselves from neglecting it, or doing anything wrong, because it will be displeasing to Him. Human praise or censure must be a secondary consideration with them. If by doing the right, they can gain the approbation of their fellow men, so much the better for them. But man's approval or disapproval should not be the sole motive for their actions. It is good to be rewarded by men, but rewards must never be

regarded as the sole incentives to a right conduct, nor must punishments be viewed as the only checks to an opposite course. Let the young under our charge learn to frame their conduct according to what is enjoined on them by their Master in heaven, and then let them rest assured that man must in the long run award to them the honour due.

But it may be here objected, that approbativeness, or a desire to rule our conduct so as to gain the approbation of our fellowmen, is a natural principle in us; and it must influence the young as well as the matured. To this we reply, that we do not absolutely censure this desire in the former. All that we mean is that this element should not have a too absorbing power. When exercised in a subordinate capacity under the control of conscience, its influence is always good. Parents and teachers must see that praise and censure may not be the only influences brought to bear upon the conduct of the young, for otherwise the voice of men will take the place of the voice of God speaking through their consciences.

Home education must again aim to inculcate the importance of self-respect, cautiousness, without any element of timidity and straightforwardness. Nothing will injure the moral principles of a child so much as to see in its parents a want of noble pride, an example of cautiousness bordering on fear, and that of duplicity. Parents should, from the dawn of reason in their children, try to impress on their minds, that however small and common the circle may be in which they will have to move, they are required to play an important part in it. They must be trained to show moral courage combined with cautiousness, and never to learn to play fast and loose with others. There are numerous other moral susceptibilities in the young which should be worked upon, and developed, by home education, but as we cannot at present deal with them we close here the first stage of a child's training, or the training given it by its parents.

The second stage of a boy's education is what he passes through at school. It is not here meant that now he is entirely without the pale of his parent's influence, but that the work of training

him is partially made over by them to professional teachers. Except in cases where boys are sent as boarders to some school, their parents have still the responsibility of looking after the development of their minds ; but hand in hand with their influence, is that of those who teach them in the schools into which they are admitted; but when parents decide in favour of a boarding school, their responsibility is considerably lessened. The Superintendent of the institution takes the place and to him they look for the formation of their boy's character and the edification of his mind. Here we may give a little time to the question whether it is advisable to make our boys board and lodge in some school, or send them there as day-scholars. Though boarding schools are in this country few in number, and those few are only of recent origin, many parents seem to be prepossessed in their favour, and there are ostensibly good reasons for it. But we must say that like all institutions, boarding schools have recommendations in their favour, as well as faults. Some men prefer them because they enable them to shirk off

their responsibilities in connection with their wards, and wash their hands of every thing concerning them, if not for good, at least during the school sessions. But this is not good. Parents or guardians should never discard their sons or wards from their society or communionship. Home must be the natural and most favourable soil for the young mind to grow; and to transplant it may be injurious to it, in many ways. Home again has many dear associations, and when a boy is removed from it he becomes a stranger to them. After passing a few years, nay a few months, he is apt to forget or even dislike his parents' hearth, to prefer the company of his teachers to that of his parents, of his schoolmates to that of his brothers and sisters. We have had with regret to notice cases in which boarders returning home on a vacation have felt very morose in the circle of their natural guardians. They have pined for their schools and shown an unnatural desire for leaving the society of their relations. A boy then being put into a boarding school is liable to grow a stranger to those who have divinely established claims to their sympathy. We presume

therefore to say that guardians should not make boarders of their wards, except in the two cases following.

First, when the latter have been too much spoiled by home indulgence to be kept under proper control.

Secondly, when there is no school near their places of residence.

It sometimes happens that a boy can never be made to work at home. He has grown too incorrigible to mend ; the gentle admonitions of his parents, their threats, produce no effect on him ; his back has grown too tough for the rod, and what can the poor parents do but send him to a boarding school.

We now come to the nature of the instruction to be sought and imparted in schools. From the time of boys' admission to schools and during their primary education, attention must be given to the three R's. Every boy, be he heir-apparent to a lord or peasant must be made proficient in them. Teach a boy to read his mother-tongue, to write it legibly, and to cast up in it, and his primary education in his vernacular will be complete. But

along with this he must be taught English, for, in the present state of things, some knowledge of this language is almost essential, except in the cases of those whom their parents intend to be mere artisans or agriculturists of an inferior order. In giving such instruction care must be taken in the selection of teachers. It often happens that a man when his prospects are dark, when he, by his intellectual shortcomings unable to shift for himself, chooses as his forlorn hope the occupation of a teacher. He opens a mere apology for a school, a *patashala*; and cursed is he who sends his son to learn at such a man's feet. If one wants to educate one's son properly, let one seek for him a trained teacher, or let one put him into a good school with good trainers. It is too common a belief that a boy passing through the primary course may be safely put under the tuition of a teacher of indifferent abilities, but no belief can be more erroneous, or more dangerous than this. To put a beginner under the training of an awkward teacher, to allow his delicate mind to be manipulated by a mere pedagogue, are mistakes, the results of which cannot

be too greatly deplored. The bad work done on the youthful mind can hardly ever be undone. Early erroneous impressions, if they ever admit of correction or removal, will take a long time to do so. We often find it necessary to make boys unlearn what they have learnt from a bad teacher. We warn guardians therefore of the injurious consequences of not making a judicious selection of teachers for them. These must be both intellectually and morally fit to do justice to their vocation ; and we are glad to note that under the auspices of the educational authorities of the day, such teachers are being trained and sent out in a considerable body every year by the normal or teacher-training institutions in the country. Would the number of such institutions were increased !

We have proposed to dwell in this essay on only what parents or guardians ought to do towards the education of their boys ; so we do not think it necessary here to point out the course to be followed with regard to these, by the schools where they are sent or by their teachers. How facts are to be presented before them, and what processes are to be adopted to

awaken their curiosity or interest or to culture their receptive powers, are questions which we reserve for future consideration. Let us therefore now consider how we should dispose of our boys on their finishing the primary course.

Whether they should take their places in the higher forms, depends on the capacities developed in them, their tastes and proclivities, and on their guardian's intentions about them. Supposing a boy has with great difficulty, and at a snail's pace, gone but indifferently through the rudiments of the primary course, suppose the way of learning has been one full of thorns to him, so that he has always disliked it, or suppose his guardian wants him to earn his bread by only manual labour, then the most prudent step for the guardian will be to take him away from school, and apprentice him to some work for which he may show a liking. We have had on many occasions to notice the lamentable results of a boy's being forced to attend school when his feelings revolted against doing so.

As to college education, it should be placed

only within the reach of the especially talented. Every boy cannot be expected to grow into a man of letters ; and every father cannot expect to see his sons dubbed B. As. and B. Ls. or M. Bs. All that parents belonging to the respectable classes ought to be anxious about is to give their sons a decent education adapted to their tastes and inclinations.

It is desirable that these should matriculate, for the Entrance Examination has now become the essential passport even to a common clerkship fetching a paltry salary. But let Collegiate education, or the education in the higher professions be regarded as within the attainment of only the favoured few. Nothing has contributed more to the poverty of the gentry of our country than the mania to have their sons graduated at any cost. People have been known to have gone so far as to have even mortgaged their domiciles to see their sons with academic gowns and hoods. The young men themselves when not of especially bright parts lose much time and labour in clambering for degrees, and find at last that in respect of position, wealth or influence, their pursuit

has been almost as profitless as that after the deceptive Jack-o-lantern.

But it may be objected that in Europe and America thousands are graduated every year, and there we do not find any deleterious consequences attending this rush for degrees. True, degrees are eagerly sought there, but only by those who have a taste for learning. There the beau ideal of a father is not to make his son a B. A. or M. A., but a useful and respectable man. Here the attempt to have a son graduated is attended by a spirit of gambling, or speculation. The father is not solvent enough to take his son through the college course; and he stakes all, even his landed properties, in the hope that one day his hopeful will earn tenfold of what he is laying out.

In Europe and America again, the learned professions are not at all so crowded as here. There is a decent number in every profession in which the most talented have the brightest career, those of mediocre abilities get on tolerably, and men who have no talents for it leave it for some other department easier and more congenial to them. In these countries you

can very hardly witness a lawyer or a doctor who makes absolutely nothing. But look at the state of things in our country. Every court has too many pleaders, every village too many doctors, every vacant school-mastership too many applicants; and the result is that horrible competition in which the competitors often lose self-respect, that insufferable heart-burn which destroys peace, that jealousy which saps the foundation of a healthy society, and that disappointment which is unmanning.

NITRATE OF LIME AND ITS VALUE AS A FERTILIZER.

Every plant requires to be fed with certain substances, in order to attain perfection. The proportion of each substance needed by different plants varies considerably; but the substances themselves are the same in kind in almost every case, and consist principally of nitrogen, potash, phosphoric acid, lime, sulphur, soda, magnesia, chlorine, and silica. A productive soil contains all these elements in sufficient abundance and will go on bearing crops incessantly, provided that all the plants which grow upon it be returned to it, either in a rotten natural condition or as the excreta and remains of the animals feeding upon them. Further, it is well known that in so-called "new countries" it is possible to grow and remove crops from the same soil for many years in succession without artificial aid, a fact which is

due to the presence in the "virgin soil" of more than enough of the various or principal elements for immediate needs. But when this store has been exhausted by constant cropping, the plants become at first sickly, and after a time altogether refuse to grow. Then arises a necessity for enriching the soil by the addition of the ingredients in which it is wanting. This operation is known as "manuring" while the materials thus supplied are called " manures". With the growth of scientific knowledge men are trying their best to dive into the secrets of utilizing natural manures to solve the problem of cultivation. A new idea has dawned upon the mind of some of our men as to how best to utilize some of the superabundant power for the manufacture of nitrate of lime as a fertilizer for the wheat fields of India. The high prices of agricultural land and of agricultural labour in the west demand that the productiveness of the soil should be raised to the highest possible pitch. To this end manures of all kinds are abundantly used, and one of the best manures is a nitrate or a chemical compound of nitrogen, which, as a powerful

plant food and plant stimulant used, is a principal constituent. Up to the present time the greater part of the nitrates used in Europe has been imported from South America where they are found in mines. In view of the popularity of nitrogenous manures, it is worth mentioning that the output from the nitrate mines of South America has reached the enormous quantity of 81 million maunds per annum valued at 30 crores of rupees. The whole is exported in ships and railway trains to wheat fields thousands of miles away. Now every time a man draws breath the bulk of the air which he inhales into his lungs is nitrogen. If, then, nitrogen is the principal ingredient of the universal atmosphere, why dig for it in distant South American mines ? Two Danish chemists have after years of patient research and experiment, solved the problem by extracting the nitrogen of the air and mixing it with lime through the agency of powerful electric currents. The result is nitrate of lime. Previously all attempts to extract nitrogen from the atmospheric mixture of gases had failed, as electricity in large quantities is essential to the Danish

chemist's operation. Works for manufacturing the new nitrate of lime have been erected in Norway where water power is abundant, and owing to the waterfalls easily converted into electric power. These works have only recently been started, but so successful has been the experiment that they are already being largely increased in order to meet the demand for nitrate which has sprung up.

Two materials are required for the manufacture of nitrate of lime, namely, air which is free, and limestone which is cheap or dear according as it abounds or is scarce locally. The third essential as already remarked is an abundance of cheap electrical power. In Kashmere, for a stretch of eighty miles along the river Jhelum a power station could, if required, be created at every sixth milestone, and each such power station would yield 10,000 horse power. We thus see that the supply of electrical energy may be regarded as practically unlimited. Further, the Kashmere hills in many places consist entirely of limestone. Besides these, there will be the proposed Kashmere Electric Railway linking the Kashmere hills with the Punjab plains, and

on this Railway the nitrate of lime to be manufactured in Kashmere could be carried at a cheap rate. Incidentally the carriage of this manure in immense quantity would add largely to the earnings of the Railway.

Judging from the combination of circumstances, it seems as if Fortune has smiled upon the Kashmere State. The Punjab cultivator cannot at present afford to manure his fields except when the value of the crop is high, as in the case of sugarcane and cotton. Ordinary manure cannot be had cheaply. Yet it is well-known that the value of the Indian wheat crop is much below what it might be if a suitable fertilizer were available at a price. Possibly the outturn could be doubled. The present average outturn of wheat in India on unmanured irrigated lands is about 14 maunds per acre. In Europe wherever there is a plentiful use of manure the outturn of wheat is as high as 40 maunds per acre. An Indian acre which at present yields Rs. 30 might thus, perhaps, be made to yield Rs. 80. The area of wheat annually irrigated by the Punjab canals alone is at present 2,000,000 acres and the new

irrigation projects will undoubtedly increase this figure considerably. In the United Provinces the area of irrigated wheat is 800,000 acres.

We can thus fairly estimate that nearly 3,000,000 acres of wheat land are within reachable distance of the proposed nitrate of lime factory in Kashmere. If the outturn of that area could be about doubled by the use of manure, the gain to the two provinces (barring aside the cost of the manure for the present) would be twelve crores of rupees annually.

It is well that we should determine now the manurial value of nitrate of lime. Agricultural chemists have hitherto had little or no practical experience of this particular nitrate. Nitrate of lime has hitherto been a rare product commercially. The nitrate of the South American mines, which is the chief nitrogenous manure used in Europe is nitrate of soda, not nitrate of lime. However, the two ought not to differ materially as they are both extremely soluble in water. In fact nitrate of lime is a better form of nitrate than nitrate of soda, inasmuch as the latter is noxious in the cases of salt-impregnated soils, whereas the former is free from all these elements.

Assuming now that nitrate of lime can double the wheat crop, is this result free from danger ? The general experience in Britain is that nitrate of soda undoubtedly has the immediate effect of increasing the outturn of most crops and especially of cereals very considerably. In many cases the total outturn has been doubled. The effect of using nitrate without any other manure, has been to diminish the fertility of soils owing presumably to the removal of large crops annually from the same piece of land, thus absorbing the other and equally necessary sources of fertility. The application of nitrates also has in Britain come to be considered as ultimately injurious. In India, of course, the conditions of fertility are different, as our soils contain other sources of fertility such as potash and phosphates in much greater proportion and nitrogenous compounds in smaller proportion than the British soils and the addition of a moderate amount of soluble nitrogenous manure ought to result, in a well-balanced soil. We must wait till scientific experiments determine the use of nitrate of lime, as a cheap and good fertilizer for the cultivation of our soil.

SOME INDUSTRIAL ASPECTS OF IVORY CARVING

From very remote antiquity, India has been a home of the elephant, and as such it is natural that the Indo-Aryan settlers of "Aryavarta," who had attained a high degree of civilization, should have learnt to domesticate this noble animal and use its products for the comfort and convenience of man. In the *Rig Veda*, verse, 1, Sukta 4, Mondul IV, we read :—"As the king with his courtiers rides on the elephant, so thou (O, Fire) goest fearlessly forward with thy flames." From the pages of the *Ramayana* and *Mahabharata*, we also glean descriptions of regiments of elephant-riders, marching to the battle-field in all the intoxication of martial glory. It is very graphically described in the *Brihatsanhita* that ivory is admired for all sorts of inlaid work with the timbers. Good ivory should be used for purposes of decoration, and

for the purpose a length of twice the circumference of the root, from the tapering end of the tusk should be taken. We do not desire to multiply quotations, to tire the patience of our readers, but from what has already been quoted, it is abundantly clear that the art of ivory-carving was known and cultivated in India from very early times.

It is very difficult in the absence of any circumstantial evidence to state exactly the time when this art was introduced in Bengal prior to the Moslem rule. We can however glean a few descriptions of ivory from the passages of the Bengali poetical works of the 16th and 17th centuries when Bidyapati, Chandidas, Mukundram, and Bharatchandra flourished. These passages are full of references to the many uses of the elephant, and in many places necklaces of pearls obtained from the elephant's skull *Gajamatihar* (which is a traditional creation of the Indian poets' fancy) are mentioned. In spite of the abundance of wild elephants in the hills and jungles of the North-eastern and South-eastern districts of Bengal, the art of ivory-carving appears to have made

little headway in the sphere of industrial progress.

We presume that the inbred dislike of the orthodox Hindus, particularly of Bengal, for all articles manufactured from bones, which are, with a few exceptions, impure things in their eyes, prevented the general use of ivory articles by them, especially in their many religious rites and ceremonies. Such articles had therefore to be kept under the ban of exclusion from one's house and this led to the decay of the art in Bengal.

Murshidabad and Rangpur are the only districts where the art of ivory-making is practised at present. The ivory-carving work of Rangpur has attained very little fame in the world of fine arts. The industry, on which they formerly lived in affluence, is now in a moribund condition for lack of encouragement, and the existing workmen have lost much of the skill their fathers possessed in the art. They have all betaken themselves to agriculture, which is their primary occupation. The work of ivory-making is now their secondary occupation. In short, the industry is at present of very small

account in Rangpur, and is not likely to endure long.

The principal centre of ivory-carving in Bengal has always been the district of Murshidabad. There are numbers of interesting traditions current in the district regarding the introduction of the art. It is said that once the Nawab of Murshidabad asked for a ear-prick and a grass one was brought to him. The Nawab said it was not worthy of the Nawab Nazim of Bengal, and he wanted, one of ivory. An ivory-carver was at once brought to Murshidabad for preparing an ivory ear-scratcher for the Nawab. In this way the art of ivory-carving was introduced into Murshidabad. There are other traditions which we do not like to repeat in these pages to tire the patience of our readers.

The ivory-carvers of Murshidabad get their raw material sometimes from Calcutta and at times from Rai Meg Raj Bahadur of Ajimganj. Murshidabad carvers generally prefer Assam or Burma ivory to others, as it is both light and soft and yields easily to the chisel without going through any preliminary process of softening.

For the solid end of the tusk, which is called the *nashidant*, the Murshidabad carvers generally pay Rs. 8-8 to Rs. 10 per seer ; for the middle portion known as *khonidant*, Rs. 15 to Rs. 16 a seer and for the thick end, which is hollow called *galhardent*, Rs. 7 to Rs. 8 per seer. Bombay ivory or rather the imported ivory which the Murshidabad carver thinks is hard, and therefore, not pliable under the chisel, sells at Rs. 2 to Rs. 3 or less per seer for the different parts of the tusk taken.

The instruments which in Murshidabad can be generally used are mostly those used by the ordinary carpenters and wood-carvers, only some are smaller and finer than theirs. They are enumerated below :—

1. Files of various sizes
2. Saws
3. Small-chisels
4. Screw-drivers
5. Awis of various sizes
6. Pliers
7. Compasses
8. A Vice
9. Mallets (wooden)
10. A. T. Square

The instruments used are of very rude description and although 70 or 80 different things are employed, they answer to one or other of the classes mentioned above, the main differences being in size and fineness.

The Murshidabad artist does not pass his ivory through any preliminary process of softening. The first he does is to cut a block of ivory of sufficient bulk for the required article. Then a sketch of what is going to be carved is drawn in pencil on the block, the sketch being either the design of the workman himself or a copy of one given to him. But a clever workman does not require any preliminary sketch if the article to be manufactured is one which he is accustomed to carve. Sometimes the design is sketched on paper. When a suitable piece has been cut out of the tusk by means of the saw and the rough tracing of the design has been made thereon, the chisels, large and small, according to the size of the parts to be chiselled off, are employed. This brings the model to a rough shape. Then files of different sizes and fineness, are employed to work the model into a finer shape ; drills of different sizes are used to drill holes for perforated work. Finishing strokes are then given with the iron pencils of various degrees of fineness, some as fine as needles and others like knife or sketch-erasers. When the model is thus brought exactly to the

designed shape, it is soaked in water for some-time and the surface is polished first with fish scales and lastly with common chalk. The Murshidabad carvers are better able to give the finishing touch with fish scales and file than with brush or anything else.

The best ivory-carvers of Berhampur can turn out any practicable model from a pattern, and they are many times employed by the European residents of the station to make crucifixes or other imitations of Western thing. But they do not seem to be able to reproduce faces or features with any approach to accuracy. The stiffness in the representation of flowers and leaves is also a well-known defect in the indigenous Indian art, and the ivory-carver does not form an exception to the rule. Perhaps, also, there is not sufficient variety of work for want of enterprise and encouragement.

No comparison, on the other hand, is possible between the articles turned out by men whose artistic tastes have, by national instinct and also for want of a special training, remained stunted for generations, and who employ the most primitive tools, and those turned out

for instance, with the help of elaborate machinery in the Crystal Palace at Sydenham. But there are many causes as to why they are appreciated by Europeans, and find a ready sale in the markets of the enlightened west. First, ivory-carving is believed by many to be primarily an Indian art, and an ivory article from the original soil is sure to have a fascination for the lovers of the art, in spite of its rudeness of design. An ivory fan from Mandalay, an ivory mat from Sylhet, an ivory Durga from Murshidabad, or an ivory Taj from Delhi, has a peculiar value of its own, whatever be the value of the workmanship. Secondly, the ivory articles made in Murshidabad and Delhi are in some cases really beautiful and artistic, though not quite so finished as similar articles made in Europe. Thirdly, the rudeness of the implements used renders the productions the more interesting. Fourthly, a complete set of ivory articles generally made in Murshidabad is beautifully illustrative of the national custom, ideas and religious practices of the Hindus of Bengal.

Professor Royle in his Lectures on the Arts and

Manufactures of India speaks very appreciably of ivory-carving as practised in India. He says "A variety of specimens of carving in ivory have been sent from different parts of India and are much to be admired whether for the size or the minuteness, for the elaborateness of detail or for the truth of representation. Among these, the ivory-carvers of Berhampur are conspicuous. They have sent a little model of themselves at work, and that by using, as the custom of India, only a few tools."

This is no doubt a very high praise, indeed, regard being had to the great authority from which it emanates, but we doubt very much whether the present generation of carvers would be able to retain unsullied their reputation. It shows, however, the high-water mark the art attained here in the middle of the last century.

For lack of encouragement the Murshidabad carvers have been obliged to sacrifice quality to quantity. Established during the declining days of the Nawabs of Murshidabad, the encouragement the art received from them was but limited and sporadic. During the palmy days of Kassimbazaar, when many

Europeans belonging to the cotton and silk-factories of the old East India Company lived there, the ivory-carvers carried on a brisk business, both in the district and out of it. Even in 1811, when the place was fast sinking into obscurity from which it had temporarily emerged, it was still "noted for silk, hosiery and inimitable ivory-work." Similarly when Berhampur rose into importance as the chief military station in the Province, the art flourished there for a time, but with the decline of the military importance of the town it began to wane, and had it not been for the railway communication which made a trade with Calcutta and Bombay possible, the art would have become defunct long ago. Formerly the ivory-carvers used at times, to get large orders from Government for supplying specimens of their work for the various exhibitions in England and other European countries, but of late it has been discontinued, as collections of these are now generally made from noblemen and zemindars, like the Nawab of Murshidabad and the Maharaja of Kassimbazaar.

Within the last 30 years the industry has alto-

gether died out of Murshidabad. Thirty years ago there were over 60 families of ivory-carvers at Mothra, Murshidabad, and even so recently as 12 years back there were about a dozen homes left. At present there are not more than 25 ivory-carvers, principals and apprentices, living in the district of Murshidabad.

The question now turns up, what is to be done for the improvement of ivory-carving. The first answer to this is that the practice of the art itself must be improved before its product can be expected to achieve popularity in enlightened countries. Without grafting on it Western patterns wholesale, it is desirable to lift the art out of its crystallized tradition, so as to give free scope to the artistic feeling and imagination which most Indian artists possess, and which the ivory-carver is fully capable of reproducing in ivory. It has well been remarked that "the spirit of the fine arts is indeed everywhere latent in India, but it has yet to be quickened into operation." If at the outset, prizes of tempting prices are offered for reproducing good European or Japanese specimens of art, it would at once effect an improve-

ment in taste and design. Secondly, we should suggest the introduction of better implements and improved methods will also solve another problem, which is closely related to the question of the amelioration of the products of art, the prices of which are at present generally above the means of the middle classes in this country. If the trade is to expand in this country, the manufacturers must be able to produce good work at moderate prices, and this end can only be attained by economy of labour and by the introduction of improved machinery.

THE NECESSITY OF TECHNICAL TRAINING IN MODERN EDUCATION

No discussion regarding the useful pursuits of life can take place at present without an emphatic recognition of the claims of industrial education. When we consider that all labour is now directed by knowledge, and must continue to be so still more in future, we may be sensible of some surprise at the little effort made in our educational system to meet this want. It will be generally admitted that an educated person should gain assistance from his studies when he comes to earn a livelihood. But our boys, for the most part, have no occupation, and are fit for none when they leave school. They know enough, but can do nothing; they have learning, but no capacity. Education is bestowed upon the mind, while all the executive functions of the physical system

are neglected. These executive functions are certainly as important as a knowledge of geography, spelling, defining and grammar ; of which the details are so often without interest, and do not in any way develop the faculties that deal with the realities of life ; nor do such studies enable the pupils to speak of anything belonging to any calling, pursuit, or manufactured article on earth. It would seem from our system of public instruction that there existed no such pursuit as that by which men can earn a living, no employment which requires manual skill of any kind, and no such things in the world as machines and tools and applied science except as mere figures of speech. To graduate one taught to think only, is like sending a ship to sea in charge of a navigator without a pilot, or a single person on board who can understand or execute his commands. Mental improvement is an inappreciable blessing, but do not the eye and the hand improve the earth and fill the world with comfort and beauty ? Man was endowed with both to subdue the earth, and a proper education necessarily includes the cultivation of a taste for lessons in regard to

things as well as ideas. Our earliest education is a sensible one, and adopted to our condition. Our first teachers and masters in philosophy are our hands, our eyes and our sensations. The facts communicated to the child by experience may seem to be acquired rather by the operations of instinct than of intellect, but the term education is as applicable to this training as to the formal teaching of the school. Whatever he sees, or hears, or feels, teaches him a thousand things necessary to a narrow set of exigencies, and gives him the mastery of his limited necessities. In fact, many of the intellectual habits of life are formed in childhood; and what he learns of useful truths and their practical application often exercises an influence for good or evil over his subsequent conduct.

Philosophy teaches that mental perceptions depend upon the senses, and that the faculty of understanding objective phenomena is in the mind. Without the senses no object would come into the mind, and without the mind no object would be understood by the senses. The latter cannot think, and the former cannot perceive. In no other

way than by the united operation of both can knowledge arise. We can thus acknowledge the elements contributed by each to our improvement, and that no use of the understanding is possible until it can represent itself in the different objects upon which the hand of labour is employed, for the mere existence of an idea or thought will never give birth to a concrete form corresponding to it, except by the aid of manual skill. This is the condition upon which all improvement or progress depends, and would seem to suggest the adequate preparation of both sense and mind for the common work. Common sense teaches that ideas have little potency until they are incarnated in deeds by the industrious hand of man. The bare idea of steam expansion hobbled along for thousands of years, until the engine of Watt converted it into the greatest power that ever swayed the world. So of the steamboat, the locomotive, the cotton-gin, and hundreds of other inventions that have revolutionized society, and in which practical mechanics have won a herculean victory almost single-handed and

alone. The essence of power exists in the mind, but without any showing or influence when it lacks executive capacity, which dwells in the organs of the physical frame, and above all in the arm, the hand, and the technic skill of the fingers.

That education has to do with manual training, is a fact that has been recognized in the educational systems of nearly all civilized nations ; and the effect of it upon the useful arts and upon the greatness and happiness of a people has not been better illustrated in modern times than in the industrial history of France. Not many centuries have elapsed since only the great and rich were able to have domestics who were qualified to supply them with some articles of trade in common use. Occasionally an artificer working alone, without influence, and without wealth would furnish an article of beauty or decorate a church with consumate grace. But the industrial classes were for the most part in a debased condition. We know that this is changed, and that the most thorough artisans in the world are found in France and that the whole world now pays tribute to her art and

taste. She has been devastated by mighty wars, her people have been scarificed by millions; her expenditure has been almost beyond computation, and yet to-day she is next to Great Britain, the richest of all nations, while perhaps her people are the happiest in Europe. We can remember her spoliation in the Franco-Prussian war, and the heavy indemnity with which she was compelled to ransom her peace; and we can also remember how she arose as if by some supernatural influence from a prostration which would have indefinitely destroyed the Industries of almost any other nation, and attained at a single step to the summit of prosperity. Just exactly how this was managed puzzled those who did not consider her cultivated arts. She had a monopoly in the markets of the world for many kinds of commodities which depend upon design and finish, and in which she had scarcely a competitor. Her skilled labour raised the status of Industry in the country, and every civilized nation contributed to her prosperity. The foundations of her success were laid when art schools were first established for the instruction of her children.

Apart from the technical and professional training afforded by the schools, there are certain marked features in the establishment which give it the air of a brotherhood. The employees and apprentices are organized into several institutions, forming a system of mutual benefit to promote the interest and welfare of all. Some of these funds are contributed by members themselves, others by assessments upon the profits of the business, and still others by the voluntary gifts from high personages for the benefit of the apprentices. There are also savings fund and accidental and life insurance funds for the benefit of the workmen. And the great success which has marked their business career points in more ways than one to the legitimate connection between capital and labour, and shows what may be accomplished by kindly offices and mutual benefactions.

"The Government of France recognizes the vast importance of extending its assistance to schools for the technical instruction of her youth. The question is regarded as one of public interest, and the current administration might as well abdicate its power as to ignore its

responsibility for the support of technical schools. In every town of any importance from a manufacturing point of view, in every district of all the principal cities, there is to be found the technical school, just as there is to be found the church or the baker's shop. All the elements of society conceive themselves equally interested in this preparation of the rising generations. Need we be astonished at the perfection of art-industry in France? When other countries are raising the standard of workmanship higher and higher, why should we occupy ourselves only with the incoherencies of discussion, the embarrassments of supplying our wants abroad, and in talking of reform?

Suppose we manufactured our own cloth, it would stimulate the supply of cotton, which can be grown in India of as good quality as in America or in other country; and labourers now idle by the thousand might cultivate the crops on land now unused, while mills and operatives to manufacture the fabric and the machinery will introduce a great industry. So of hemp, of wool, and woollen goods, in the production of which we might soon excel the

western nations by the use of ingenuous machines, thereby off-setting their prodigious supply of manual labour. We import vast quantities of iron, steel, copper, zinc, and the beautiful articles into which all the metal are fabricated, and yet these materials are found in widely diffused abundance within our own limits. And sometimes it happens that multitudes of our own people are suffering for want of work, for the simple reason that there is greater skill used abroad in these trades than that which our own workmen have an opportunity of acquiring.

The same holds true in regard to fine porcelain, silks, jewellery, and countless other utilities, which can only be produced by skilled labour and mechanical science.

Great are the effects of art-education in diffusing the spirit of general improvement among the mechanic and manufacturing industries. Indeed art is the origin of the first price we pay for all things. This is especially apparent in those wonderful triumphs of human ingenuity where it has conferred upon material of the most trivial cost a value almost beyond belief. The baser metals are often converted, by

mechanical art and into forms which assume a value exceeding their weight in gold.

We may now ask, with all the propriety of a subject race, what, then, is the right and duty of the State in relation to technical training in modern education? That the Government is created for the good of the people, and ought to provide every element of education necessary for their growth as a free and superior race. That the essential thing in education is to apply it to some useful purpose, having for its aim what is for the advantage of society and the development of the individual, and improving all the faculties of man, physical, intellectual and moral, by studies appropriate to their unfoldment. It ought to develop the talents of the young and make them men of the age in which they live, so as to adapt their intelligence to the substantial transactions of life.

As the sciences are now connected with every industrial pursuit, the immense value of some knowledge on these subjects is apparent, for upon them, as guides and instruments, must largely depend the future industry and happiness of the people. Tho applications of the exact

sceinces to the processes of industry is a matter of the deepest interest to the inventor, the artisan and the manufacturer. Education ought to be adapted to this state of society in order to prepare our young men for the active spheres of their future work. The time has, therefore, come when preparatory studies should be placed in the programmes of public instruction, especially to teach the natural laws which affect the different trades, together with exercise in hand-work, and the use of tools in general practice, in order to fit the young to master the special industry they intend to pursue.

Whether the learning of trades is a proper part of public education is a problem which must finally be determined by the utilitarian struggle our lot in this country demands. The prejudices against it are relaxing, and we may be sure that whatever will bear the test of application, and the observation of a rigorous comparison, will ultimately be established by the gradual process of evolution. Considering the hard struggle for existence, we cannot as a nation, dispense with the question of industrial education, as it will necessarily usher in a new

era of civilization, for it will deal with that kind of study which bears most vitally upon the personal welfare of the industrial classes and is equally necessary to maintain our superiority in the social and material activities of life.

None will deny that such education has a moral grandeur of its own. It proceeds upon the theory that they should receive such instruction as would enable them to enter upon some useful pursuit, and at the same time give them an opportunity to acquire a general education, so that they will turn out to be good workmen and intelligent social beings. This is the need of this nation. Industrial education is our notorious want. A thousand things combine to mould the institutions of a people. Commerce, climate, the attraction of novel inventions, the love of imitation, and the vicissitudes of war—all contribute to national character. But the ornamentation of human existence will hereafter evolve the most important additions to human wealth and advancement ; and Art-Industry, that waxing giant of the future, is already at the doors of our educational system, knocking for admission,

and promising, not only to furnish skill to our labour, but to elevate our taste and embellish our ordinary existence with its cheerful and refining influence.

Art Industry regarded merely in its economic simplicity, and accuracy, must be considered among the humanizing accomplishments of mankind. Its relation to the fine arts is only distinguishable as going before them in the necessities of life and in the facilities which it presents to the masses of the people in its various employments and discoveries.

Indeed, industrial education is the working man's best friend and hope in the world and the advantages which it holds out for his improvement are practically endless. By means of it he may expect not only to realize greater perfection in his work, but also an advance in his social relations, for when art and skill in any direction whatever are developed, they are and must be accompanied by an education of general taste, and an improvement in mind and manners, that will bring him abrest with the best associates in his immediate society.

A PLEA FOR AGRICULTURAL EDUCATION IN OUR SCHOOLS

One of the characteristics of our system of education is the undue importance attached to books. From the first day a boy enters the school and begins the infant primer, matters are so arranged for him that he comes to regard books as the *summum bonum* of life. The passionate interest of an English school boy in the many objects of nature, both animate, and inanimate, the time he loves to spend in their company gaining unconsciously a knowledge of their peculiarities, and his mania for possessing collections of natural objects, whether rocks, shells, butterflies, birds, or plants—these are traits conspicuous in us by their absence, the inborn love of nature never having been fostered in us by our educational methods. The evil habit of getting fettered ourselves to books, formed at an early

stage, in our education gathers strength as we advance higher till it constitutes a permanent characteristic in us. Observation and the passion for first-hand knowledge were strongly developed features in us long before we came under the present system of education, and to this day characterise to some extent many whose lot is to labour in the fields, and whom English education has not yet touched. One can never imagine, for instance, a greater triumph achieved by these qualities, than the *yoga* practices, which are the result of the most intelligent and patient study of the habits of hybernating animals in their natural abodes; and so are our medicine, our astronomy, and our agriculture the result of intelligent observation. Judged in fact by its past character, it is plain that the material that our educational system has to work upon is not altogether bad; and if any radical change has been brought for the worse, the blame ought only to be laid at the door of this apotheosis of book knowledge. To arouse curiosity in the school boy, to quicken his passion for knowledge, to develop the faculty of observation, to train the eye and the hand, and thereby furnish him with

the key to the temple of knowledge, are disregarded in favour of storing the mind with a mass of facts, in a manner that makes study an irksome task, and often chills in the average school boy his thirst for knowledge.

The lack of facilities for imparting an intelligent and practical knowledge of the commonest objects, otherwise than through books, is deplorable. All that we have is a dreary round of books from beginning to end; books on history, geography, geometry, literature, facts about Akbar, Nadir Shah, Mir Kassim,—these are crammed into our brain something like loading the stomach with marbles.

Now this method of divorcing the field from the school-room has consequences that affect both the teacher and the pupil. It makes teaching difficult and dull. An honest teacher striving to make his pupils understand all that he teaches from the book must find it very hard indeed to do so satisfactorily; while in the case of the ordinary teacher it necessitates his resorting to those recognized aids to teaching such as thumping, boxing, abuses and blows. It makes the learner's lot painful, and engenders in him

a distaste for study. It taxes and burdens his memory and this tells upon his more valuable faculty of thinking and impairs it to a proportionate extent. Knowledge rendered only a matter of memory, and acquired and retained only for the purpose of passing an examination is never a permanent asset of the boy, but is forgotten soon after the strain of the examination is removed. This confining one's teaching to books is in fact working against the boy's natural inclination. The child loves to roam in the garden, to watch little birds and animals, flowers and plants ; he fashions objects out of mud to play with, or spends hours in splashing in a pool, cutting channels or damming them. To take advantage of this natural impulse, to improve his powers and to enlarge the sphere of his observation, and to teach him to imitate on paper and in clay the beautiful forms he loves to see in nature,—these will make the pursuit of knowledge attractive, and its acquisition easy and permanent.

Besides, there is a mere waste of time and energy in storing the minds of our

boys with informations that become of no avail to them when they come of age and enter the arena of the world to struggle for existence of life. Froude has very pertinently, remarked "knowledge which a man can use is the only real knowledge, the only knowledge which has life and growth in it. The rest hangs like dust about the brain or dries like rain drops on the stones." Of what use then would our boys be if they could not earn for themselves. They would turn out to be no better than moral wrecks of society. Is it not doubly reasonable that some practical teaching should be imparted to these boys who have no special aptitude for academic education?

Ours is again a country with a population of 300 millions of whom 70 per cent. live on agriculture. Is it not therefore strange that there should be no organization worth the name for the diffusion of agricultural knowledge among all classes of people of India where agriculture is of such vital importance and takes the foremost place in the rural economy of the country? Even such advanced countries as Germany, France, Belgium and England, where agricul-

ture is comparatively of subsidiary importance, and where the proportion of people depending on agriculture is very small, have found it necessary to support at considerable expense to their respective states large numbers of agricultural institutions of different grades. For instance in North Germany alone, there are no less than thirteen Agricultural Colleges or Institutes connected with the local Universities, of which the Royal Agricultural High School in Berlin alone costs the State £ 100 per pupil, or taking an averge of 70 students the total sum of £ 7,000, per annum. The agricultural academy of Hohenwheim at Wurtemberg, which far from being an expensive institution of its kind has a similar State grant which exceeds £ 5,000 per annum. Those, however, are Institutions where the arrangements are for imparting higher agricultural education.

For intermediate agricultural education, in Prussia alone there are 16 schools with nearly 2,000 pupils and a State subsidy of £ 18,579, per annum. Similarly for Lower Agricultural Education, there are altogether

32 farming schools in the kingdom of Prussia and three more in Saxony. The State subvention to the thirteen provinces in which these schools are distributed is £ 6,698 and Provincial grants £ 10,376. Besides these, there are Agricultural Societies and Control or Experimental Stations distributed all over the country. In Prussia alone, there are again 27 Central Stations and 1710 Agricultural Societies of which 4 are provincial, 37 central, 1, 271 branch, and 398 independent. These 27 Central Stations are subsided by the Government to the amount of £ 6,525 and receive a further provincial grant of £ 3,345 annually. They employ about 70 skilled agricultural chemists and a considerable number of botanists in the interest of the cultivation of the soil, whereas in whole India it would be difficult to enumerate a dozen qualified men who find sufficient encouragement to devote their time to these branches of applied science.

Moreover in addition to the regular agricultural institutions, there are vast numbers of what may be called Improvement Schools where instruction is intermittent, being given in winter

or in evenings only. The outlay at such schools is considerable and is partly met from the fees paid by the pupils but mostly from the funds of the provincial administration, from the ministry of agriculture, and from local agricultural societies. Travelling lecturers are also engaged during the summer months to give instruction in theoretical agriculture and are paid generally by the provincial agricultural Societies, and are under the control of these associations. It would not be right in our enumeration entirely to omit the various dairy, shoeing, and housekeeping schools, more or less of a special nature, but in some sense connected with the education of the future cultivators of the soil.

In France also, the State grants to agricultural institutions are no less than £10,778. Students winning laurels at the final examination as Agricultural Institutions in France, are granted a travelling scholarship by the State tenable for three years. The schools for imparting lower agricultural education is peculiar in one way. The pupils not only receive a fair amount of Scientific training and general instruction, but are also trained in farm work entirely free

of cost. The pupils are in fact apprentices and are so styled.

Denmark which is by no means very much advanced in agricultural education and which possesses a population of only about two millions, has not neglected the matter and indeed no less than £ 11,000 are annually devoted to this object by the State. The most important agricultural institution in Denmark is the Government establishment of the Royal Veterinary and Agricultural College which is maintained entirely by the State at a cost of about £ 7,000 a year. Even Belgium and Netherlands where agricultural education has by no means attained the importance which has been given to it by the other continental states, have by no means been slow to appreciate the usefulness of agricultural education. State Agricultural Institutes have been established in both countries ; there are two High Schools of Agriculture, one at Gembloux in Belgium and the other at Wageningen in Holland. The cost of the former to the State is £4,406 or about £60 per head per annum, and that of the latter £538. Just imagine what a vast amount of

money is spent on agricultural education in European countries and what gigantic are the operations for the maintenance of agricultural schools by the State. Our Government spends only about Rs. 9,00,000 on education per year including Lower Primary and Higher—not to speak of any agricultural education worth the name. No doubt something has been attempted in this direction of late, but it is mere minnows compared to the titans of European countries.

Take the case of Japan. She is far ahead of us in matters of agricultural education. Nothing better illustrates the thoroughness which is characteristic of the Japanese nation than the manner in which the government has initiated, developed and organised agricultural education and research, and the response of the people to the head of government. Sir Fredric Nicholson estimates the total expenditure, Imperial and Local, on agriculture and agricultural education at not less than Rs. 180 lakhs per annum. Agricultural education begins in the Higher Elementary School, in a large number of which the pupils are taught Agriculture and Natural Science. All teachers in Japan receive

instruction in these subjects at the Normal Training Schools. In close connection with the elementary schools are 1,436 supplementary schools which give more extended instruction in agriculture. These are either evening schools, or give short courses in the winter months or during slack seasons, and are largely attended. Next come 118 regular agricultural schools of two grades, the lower and the higher. To both these classes of schools are attached experimental and demonstration farms, which serve for the instruction not only of the pupils, but also of the agricultural population in their neighbourhood. There are again no less than 300 itinerant lecturers who give instruction in agriculture and alied subjects.

Judged again by its practical use, we see that a system of agricultural education ought to be recognised as one of our foremost needs. We are an agricultural people and it is an obvious necessity that our boys should learn the scientific principles of good husbandry. To the vast majority of our school-boys who fail to pass examinations, our education becomes valueless as a means of livelihood. Far from equipping

them for an honest profession our education converts them into costly drores, with whom education is synonymous with fashionable clothing and a contempt for manual labour. It is reasonable to expect that agricultural instruction in our schools will in some measure remove this reproach from our system of education and even if it does nothing else, it would have justified its adoption.

We should suggest the establishment of a Higher Central College of Agriculture managed by agricultural experts from European and American countries. A few of our brilliant graduates should be attached to this college for agricultural training. The course should be one of three years. The subjects of study should be books on Improved Methods of Agriculture, applied Chemistry, Botany, Geology and Zodgy. Two or three agricultural farms should be attached to the college where the boys would devote their hours on practical agriculture. They should receive the diploma of Master of Agriculture and should do research work for the degree. After they have passed the final examination, they should become Professors of Intermediate

Schools of Agriculture which should be established one in Bombay, one in Madras, one in the Central Provinces and one in Bengal. Students who have passed the Matriculation or the First Examination in Arts should receive instruction in these colleges. A book in Bengali and other Vernacular dialects of the respective provinces should be written on Improved methods of agriculture, the book should especially deal with soils origin, formation, distribution, tillage, (II) Manure-varieties, action, uses, (III) crops-varieties, culture, uses, (IV) Stock-Races, breeding, feeding, general management, (V) Implements-Machines, tools, water-lifts. It should be read in Intermediate Agricultural Schools. Lower Primary Schools should also have small gardens or miniature farms attached to them. Easy primers on agriculture should be written for these schools. Such is our rough sketch of Agricultural Education in India. Nothing but practical demonstration will do them any good, and schools-gardens, however modest, will serve as object lessons in improved agriculture and, who knows, may even become the nucleus of a wide spread enlightenment.

ART EDUCATION APPLIED TO INDUSTRY

Art plays a most prominent part in the development of industries. "The Arts" says an Academician " are the landmarks of civilization. By their means we are instructed no less in the social progress than in the extent of refinement to which at various periods the most celebrated nations of the earth have arrived. The language of Art, the means which the graphic and plastic arts supplied, were among the earliest employed by the nations of antiquity for the expression of their religious aspirations recorded in characters and forms of objects with which they were familiar, subordinated to an imaginative treatment which was not the mere results of accident, but a studied reflection of their spiritual wants as well as of their social condition."

Taking this wider view of Art, and all that its application suggests in relation to the progress and the life of a people, and our estimate of their culture, we should say India ranked foremost in the sphere of Art culture. The Indians worked upon original lines, and produce something very different in many respects from anything previously known—drawing their leading ideas from a study of Nature, and inspired by some of the more subtle principles which govern the evolution of grace and beauty in the vegetable and animal kingdoms. The ideal of Art was something nobler and higher than those of other nations.

Hogarth has very pertinently remarked in his "Analysis of Beauty" what the dominating ideas of beauty are and where to find them, showing also the modes as to their application to industries. He endeavours to show that "the principles are in Nature by which we are directed to call the forms of some ideas beautiful, others ugly, some graceful, and others the reverse, by considering more minutely than has hitherto been done, the nature of those lines and their different

combinations, which serve to raise in the mind the ideas of all the variety of forms imaginable," and he suggests that those principles are discoverable. So also, in his chapter on "variety" he again insists upon this quality as underlying "all excellence." "How great a share variety" he says "has in producing beauty may be seen in the ornamental part of Nature. The shapes and colours of plants, flowers, leaves, the paintings in butterflies' wings, shells, etc., seem of little other intended use than that of entertaining the eye with the pleasure of variety. All the senses delight in it, and are equally averse to sameness."

The statements of this Art-critic apply very forcibly to the Art manufactures of India. Her decorative paintings and the decorative wood-carving are simply unrivalled in beauty. Delhi, Amritsar, Lahore, Alwar, Jhelum, Rawalpindi and Sialkote are places extant with vestiges of these Art-manufactures. Our ornaments of jewellery and gold, our shell ornaments, our brass and copper vessels, our inland wood-work, our lapidayr's work, our pottery, our cotton fabrics go to show what a high place India

occupied in the sphere of her Art-culture, and what huge industries she raised at one time by its aid—industries that were once the wonder and admiration of foreigners.

The decadence of these industries are due to our apathy to the development of Art-culture in India. Science now leads the vanguard of refinement in every sphere of Industrial culture. The one result of this has been the total extinction of Art-culture everywhere. Our homesteads are now seen dotted with worthless stuffs of western make, where reigned once our indigenous Art-manufactures. It does not follow that superiority of scientific culture carries with it any pre-eminence in matters of art, taste, or fancy. Lord Napier has very truly said in his address on the "Fine Arts in India." "Because the European nation to which your destinies are attached possesses higher scientific knowledge, greater mechanical knowledge, juster principles of government, and superior energy in war, it does not at all follow that, in matters of fancy or taste, that nation has a monopoly of what is beautiful and what is true." The inventive faculty of the

Englishman exceeds that of any other people, but he has not had the advantages of artistic training. He has filled the world with useful labour-saving machines, without adding much to the sum of grace and beauty.

We are now trying to engraft this Industrialism of the west on our soil. The idea that Art has necessary relation to industry rarely enters into the mind of those most interested in the matter. Our mechanics are now found to be too often workmen, and not artisans. If this condition of things is not changed, we shall go downwards in the depths of degradation, and will never be able to gain independence or individuality. Art is not simply amusement, an indulgence which delights the fancy of the idle and the rich. It is decidedly practical, and concerns the well-being, the advancement, the pleasure, of the labourer and the poor. Whenever art is applied to the simplest, commonest product of labour, there will come order, intelligence, grace and increased value.

How can it be developed ? How can it be applied ? How can it be put to the best use ? There need be no uncertain answer to these

questions. The experience of other nations teaches us what we have to do, and how it is to be done. It is by technical education in government and private schools, of course on *Swadeshi* lines; by the study of great works of art as developed in India; by the establishment of *Swadeshi* Museums or exhibitions which shall be open to the public; by the organization of private societies in the interest of special industries; by expositions of our pictures, statuary, objects of ancient art, and of all products into whose composition art may enter.

The terms art and industry in their relation to each other, are now in frequent use all over the civilized world, and among most of the leading nations there is at the present time, more than ever before, an effort to unite art and industry. In a general way, the public know that the result of this is to make the common utensils of life beautiful instead of ugly, but just what art and industry are by themselves, and the process by which they become associated, is not so well understood.

We think it would be worth our while, considering the importance of art education in India,

to attempt a definition of art and industry, and to explain how the one may be applied to the other.

Industry is work. It is the action of the muscular and moral forces of man applied to production. Art is also a production, but with certain conditions and with a certain definite object in view, which we call grace, beauty, and such other terms as express something attractive. It is the province of art to invest production with an ideal of perfection. While industry sometimes seeks this assistance from art, it must be remembered that art, even in it, highest expression, demands the aid of industry but only within arbitrary and restricted limits. An object constructed for its beauty and as a decoration consults only the law of beauty. But in the application of art to industry, the use of the object must never be forgotten. The products of industry in India into which art has entered are innumerable. Our artisans conceived the most beautiful thoughts of Nature and tried by their aid to purify and enlighten the social atmosphere.

The art products of the Buddhist period, serve as admirable models in art educations

the beautiful architectural and sculptural remains of the period testify to this day the development of Art-culture in India. Buddhist Hindus developed their school of architecture themselves from the very commencement ; they created their own style, which is purely Indian so also, in sculpture, they were not indebted, to any foreign influence. The remarkable iron pillar near the Kutali river has been seen by every tourist and traveller who has been to Delhi. Of the *Stupas*, the Bhilsa topes are the most beautiful in the kingdom of Bhopal. It would require a volume to attempt to describe the objects characteristic of the development of industrial art of that period.

The work of art is a law to itself. The sculptor make use of clay and marble, the painter of pigments and canvas, as the means to express his idea of beauty.

The purely artistic idea may be removed from the thought of use, yet the influence of industry upon art is varied and essential. Of the arts of sculpture, painting, and architecture, those of sculpture and painting are not seriously modified or changed, either in principles or

practice by the intervention of industry. The same tools and the same material have been in use since the birth of these arts. A mass of clay, stone, marble, or wood, with a handful of tools are essentials of one; piece of canvas, or panel, or porcelain, with colours, brushes and pencils, serves for the other. It is the function of the artist to evolve beauty and grace out of these articles required for industrial use in his designs of various art-manufactures.

The industrial arts in Italy follow the great traditions of that country. Italy does not, like England, favour general education in art; but she does hope by the establishment of schools of industrial art to renew and enlarge those special industries for which she has been celebrated. The manufacture of glass; the rare carvings; the wonderful Florentine and Roman mosaics; the ornamental sculpture in bronze and marble; the work of goldsmiths, jewellers and cabinet-makers—all of these have distinguished the genius of Italy. To make great sculptors and painters, to educate skilled workmen in these industries, is the pride and effort of Italy at the present time. In Florance

there is a School Sculpture in wood founded by a private society, the expenses of which amount to 3,000 francs—a franc being equal to the value of a little over 9¾d. of English money. The Ministry of Industry and the Municipal Government, each furnish a subsidy to this school. In Serona there is also a school of art and manufacture, the expenses of which is 15,000 francs, of which one-third is paid by the State. Venice has six schools of arts applied to industry. Just think what a vast amount of money is spent in Italy for the development of her art course.

Japan, has of late years, made a headway in the sphere of her industrial arts. The Government of Japan spends a vast amount of money for the development of her Art culture. Academies have also been founded to spread art-education in Japan. When every country is moving towards the goal of industrial regeneration, why should we idly sleep over the opportunities afforded by the example of foreign countries. Arise, awake and fight the battle manfully all the glory will be yours.

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